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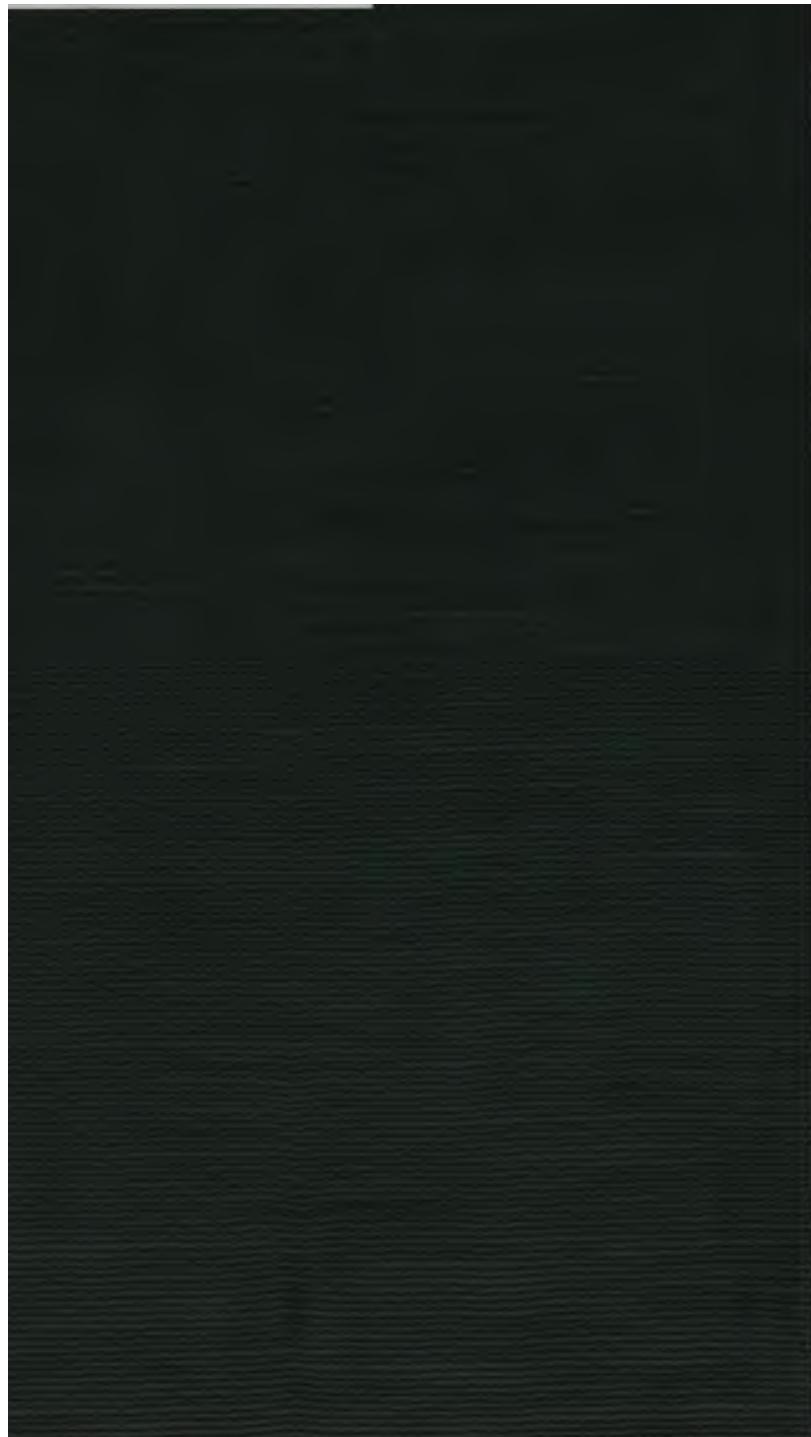
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TENTH ANNUAL REPORT

OF THE

STATE MINE INSPECTORS

OF THE

STATE OF MISSOURI

FOR THE

YEAR ENDING JUNE 30, 1896.



JEFFERSON CITY:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.

1896.

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LETTER OF TRANSMITTAL.

STATE OF MISSOURI,
OFFICE OF STATE MINE INSPECTOR.]

Hon. LEE MERIWETHER, Labor Commissioner, Jefferson City, Mo.:

SIR—I have the honor to submit herewith the tenth annual report on the coal mines of Missouri, for the year ending June 30, 1896.

8014

Respectfully,

CHAS. EVANS,

State Mine Inspector.

MISSOURI SURVEY, 14 DEC. 1901

MISSOURI GEOL. SURVEY.



INTRODUCTION.

In presenting this, the Tenth annual report of this Department, to its readers, I am afforded the pleasure of stating that we have had another year of comparative peace and harmony between operators and miners.

But very few strikes have occurred and none of which assumed to prominence; those occurring were adjusted without serious loss of time or money to either party involved.

In looking back over the past year and remembering the many occasions for suggesting and ordering changes and improvements, I am gratified with the almost universal promptness and willingness on the part of operators, to comply with my wishes and instructions, also with their very evident desire to fully comply with the mining laws of the State.

During the fiscal year ending June 30, 1896, I made 515 inspections, the prime object of which was to see that the laws were observed relative to ventilation, sanitary condition, safety of the miner generally, and especially his safety in connection with the facilities furnished for easy and rapid exit from the mine in the event of danger. To secure these results and see that the same were at all times maintained, I considered to be my most important duty, and my best efforts have been exercised to this end.

The most difficult task that I have had to contend with as Mine Inspector, has been that of securing an avenue of escape in case of accident or fire, other than that used as the hoisting shaft. I have been compelled to close several mines for non-compliance with the law in this respect.

All of the larger mines were inspected three times during the year, and some of them four and five times as circumstances and conditions appeared to require it. Where ventilation was found defective or the safety of the miner endangered by neglect or otherwise, instructions were invariably given to remedy the defects at once; with

but one exception in the entire State have I met with a failure to comply with my instructions within a reasonable length of time.

In my former report, I referred to the fact that I had been as considerate and lenient to mine owners as the duties of my position would permit. I have pursued the same course during the past year, having no desire to work a hardship or an injury on anyone, when the same could be avoided consistently with my duty to the State.

By referring to the table of improvements to be found in this report, a glance will suffice to indicate that repairs and additions are being made annually of such nature as add to the safety and convenience of the miner and meet the demands made by the mining laws.

The results of my labors as Inspector, and the numerous details connected with the inspection of so many mines are fully set forth in my notes on mines under head of the respective coal producing counties.

Mr. J. W. Marsteller deserves special mention in connection with the work of this Department. He has at all times displayed a deep interest in everything connected with the coal mining industry of the State, and to his fidelity and capability much credit is due for the statistical presentations made in this report. He is an adept as a draughtsman, and exceedingly accurate in all calculations; his suggestions have also been valuable in other directions, which I take pleasure in acknowledging.

REPORT.

Our report for the fiscal year ending June 30, 1896, shows the product of our coal mines for the year to have exceeded the corresponding period of the year before by 137,066 tons; with an increase of the money value of the same of \$66,021.

The wide difference that may be observed between increased tonnage and increased receipts, is due, as a matter of course, to the difference in the price received for the product last year and that of the year before.

This difference, while amounting to only four cents on the ton, may appear quite small, yet when we turn to the coal producers to reckon how they have been affected by it, we find that they would be \$96,805.88 better off than they are had this simple four cents per ton been added to the price received for coal last year.

Another feature which will likely be noticed is that of an increased tonnage, with 30 less mines and many less miners than were employed the year previous. This to those unacquainted with the conditions existing may appear paradoxical, yet the situation is such that out of the total number of mines operated in this State one-twentieth of the number can be picked out that have the capacity and facilities to duplicate the entire product of last year.

The reason for a suspension of operations by thirty mines during the past year is attributable to several causes; primarily it is due to a depressed market and a light demand, a condition always embraced by the liveliest competition. These mines doubtless worked when they could and as long as they could; failing to meet successfully the active and powerful competition of the large corporations, they went under and their miners of necessity sought other fields or occupations.

The loss of 30 mines in the production of coal did not affect the supply, but to the contrary an increase of the product is realized, and this accomplished easily; all that was necessary was for the large companies to work more days with the usual number of miners. The great majority of our mines are small and operated by parties possess-

ing but limited means and facilities. There are 329 individuals or corporations operating 372 mines in this State; two of these corporations mine 40 per cent of the entire product; 12 corporations produce 75 per cent of the entire product. From this showing and remembering the extra facilities combined with the power and influence wielded by the large companies, against which the large concerns that the small operator has to contend with, it is not surprising to find the number of our operators growing less year after year. Aside from a few country mines distant from the railroads and which supply a neighborhood demand, we can see no chance for the small operator under existing conditions to survive many years longer.

Reports have been received from 372 mines located in 33 counties. There are 167 shaft openings, 66 slopes, 79 drifts and 60 strip-pits. The power employed at the mines except strip-pits, is as follows: steam-power at 78, horse-power at 112 and hand-power at 122 mines.

Ventilation is produced in the mines by the use of 49 fans, 146 furnaces, and at 116 mines natural ventilation is relied on.

Of the two methods employed in underground work, the long-wall plan is in use at 146 mines, while 165 mines are worked on the pillar and room system.

During the past year 51,654 kegs of powder were consumed in the mines at a cost to the miners of \$72,904.10.

The total number of men employed in and about the mines during the winter was 7992, and the number employed during the summer was 5184, or an average of 6588 for the year.

The number of miners employed in winter was 6676, and in summer 4287, or an average during the entire year of 5482.

Other employes during the winter numbered 1316, and in the summer season 897, or an average during the year of 1106.

The product of the coal mines for the year amounts to 2,420,147 tons; an increase compared with the preceding year of 6 per cent. The total receipts from the sale of the product amounted to \$2,741,711. The average price received at the mines per ton of coal was \$1.13.

In the production of the above product 16 lives were lost and 20 men were injured. The number of tons of coal mined for each life lost was 151,272.

The cause and nature of the accidents will be found fully described under the head of accidents.

During the year 8 new mines were opened, and 6 old mines worked out and abandoned.

TABLE I.

Statistical summary of the collieries of Missouri for the year ending June 30, 1896.

	1895	1896	Inc.	Dec.
No. of counties producing coal.....	34	33	.....	1
No. of mines including strip-pits.....	402	372	.....	30
No. of mines employing 10 or more men..	126	122	.....	4
No. of fans in use.....	56	49	.....	7
No. of tons of coal mined.....	2,283,081	2,420,147	137,066	
Amount received for out-put	\$2,675,690	\$2,741,711	\$66,021	
Average price received per ton at mine... ..	\$1.17	\$1.13	.....	4c
Total number men employed in winter...	8,856	7,992	.....	864
Total number men employed in summer..	5,634	5,184	.....	450
Total number miners employed in winter.	7,431	6,876	.....	755
Total number miners employed in summer	4,598	4,287	.....	311
Total number other employes in winter..	1,425	1,316	.....	109
Total number other employes in summer	1,036	897	.....	130
Total number kegs of powder used.....	42,975	51,654	8,679	
Total cost of powder.....	\$78,223	\$72,904	.....	\$5,319
Total number men fatally injured.....	13	16	3	
Total number men non-fatally injured...	15	20	5	
Total number wives made widows.....	9	13	4	
Total number children made fatherless...	18	8	.....	10
Total number tons mined for each life lost	175,621	151,272	.....	24,349
No. tons mined for each non-fatal accident	152,205	121,007	.....	31,197
No. new mines opened.....	15	8	.....	7
No. mines worked out or abandoned....	8	6	.....	2

R.M.I.

TABLE II.

This table is a record of new mines opened and old mines abandoned during the past year, with the name of the company or operator opening a new mine or abandoning an old one:

New mines opened.	Counties.	Old mines abandoned.
Pennsylvania Coal Co	Adair. ....	.....
	Barton	State Line shaft
	"	Sunshine mine.....
	Bates.....	Sim Jay mine.....
	Johnson.....	Knob Noster Coal mine.....
Odessa Coal Co.....	Lafayette.....	Corder Coal Co
Rob't Ford.....	Livingston .....	.....
Wellsville Black Diamond Coal Co	Montgomery.....	.....
Rodgers Bros. Coal Co.....	Putnam.....	.....
Jones & Davies.....	Randolph.....	.....
Central Coal Co., mine No. 9....	Vernon	Central Coal Co., mine No. 7.
Knoxville Coal mine.....	Ray .....	.....

TABLE III.

This table is a recapitulation of improvements at all mines, grouped in totals under the respective kinds of improvements.

Classified improvements at the mines for year ending June 30, 1896.

Air-courses (feet).....	4,000
" enlarged.....	5
Boilers.....	2
Cables extended.....	1
Cages.....	9
Catches on cages.....	8
Covers for cages.....	8
Drums.....	1
Engines.....	7
" repaired.....	2
" houses.....	5
Entries enlarged.....	8
Fans erected.....	4
Furnaces built.....	2
" repaired and enlarged.....	2
Horse-powers, new.....	1
Houses built for miners.....	6
Overcasts put in.....	4
Pit-cars built and renewed.....	248
Pit-heads erected.....	4
Platforms.....	1
Pumps.....	3
Repair-shops erected.....	2
Revolving screens.....	3
Ropes, hoisting.....	20
Scales.....	3
Screens.....	3
Shafts, new.....	15
" air.....	19
" retimbered.....	5
Side-tracks (miles).....	3
Slope opening.....	2
Smoke-stacks.....	2
Stairways in escape-shafts.....	1
Tipple-houses.....	2
Tracks in mines (miles).....	2
Weigh-houses.....	4

TABLE IV.

Showing by counties the principal improvements made in Coal Mines during the year ending June 30, 1896.

Coal company.	County.	Improvements.
D. C. Scott.....	Adair.....	Mine reopened and timbered.
O. K. Coal Co.....	".....	Five new pit-cars made and general improvements in mine.
Pennsylvania Coal Co.,	".....	New shaft sunk, engine-house built and engine set.
Albert Detienne.....	Audrain.....	New shaft sunk.
Waddington mine	".....	New shaft sunk.
Baney & Hetherly.....	Bates.....	New air-shaft sunk.
Bruce & Rees Coal Co.....	".....	New shaft, sink, engine-house pit-head, tipple and weigh-house erected, new ropes, cages, catches and covers for cages supplied, 20 new pit cars made and one mile of railroad track built.
Martin & Gee.....	".....	New boiler bought and set.
Rich Hill Coal Co.....	".....	A new screen erected at Mine No. 15 and 4000 feet of air-course cleaned and retimbered. New air-shaft sunk at Mine No. 19 and a 12 foot fan erected, 50 pit-cars remodeled.
C. T. Sequier.....	".....	Half mile of tramway built from mine to railroad track.
Kansas Line Coal Co.....	".....	Half mile tramway from mine to railroad track. New tipple built.
J. M. Tally.....	".....	Air-shaft sunk and entry brushed.
Rankin Bros.....	".....	Air shaft sunk and drainage made.
Henry Washburn.....	".....	Slope driven for ventilation and drainage.
Betz & Breinigle.....	Barton.....	New slope opened.
W. H. Hanshaw.....	".....	New shaft sunk and a new hoisting apparatus erected.
Henry Waterman.....	".....	New drainage made.
Cox & Thomas.....	".....	New shaft sunk with new rigging.
Walsen Hill Coal Mine.....	".....	Air shaft sunk and 300 yards of entry brushed for mules.
Blackfoot Coal Co	Boone.....	A new escapement-shaft sunk.
Carter Bros.....	".....	New shaft sunk; equipped with new hoisting apparatus.
Caldwell Coal Co.....	".....	Two new hoisting ropes.
Kingston Coal Co.....	".....	Main shaft sunk to lower coal seam.
Carlton Valley Mine.....	Callaway.....	New furnace built.
Fulton Fire Brick and Mining Co.....	".....	Entries brushed and mules put in the mine to haul out coal in place of men.
William Castle.....	".....	Air course and entry enlarged.
Massey & Reynolds.....	".....	Entries reimbursed.
James Smith.....	".....	Air-shaft sunk and a new wind-mill erected to take out water.
Creighton Coal Co.....	Cass.....	New shaft sunk.

J. H. Young	Cedar.....	Four new pit-cars built, and two new openings made to mine.
Missouri City Coal Co.....	Clay.....	Escapement-shaft sunk, a new fan erected, 25 new pit-cars built, switch extended.
H. W. Jenkins	Cooper.....	New Syphon pump and pipe.
W. T. Kinney	Dade	New shaft sunk and equipped.
Grundy County Coal Co.....	Grundy.....	New blacksmith shop built.
Theo. Gehardt	Henry.....	New weigh-house built.
W. E. Hughes	"	New air-shaft sunk.
McLeod Mine No. 2	Johnson	Air-shaft sunk and new works opened.
B. F. Wood	Lafayette	New air-shaft sunk.
Bonanza Coal Co.....	"	Rock brush on main entries.
George Bond	"	Air-shaft sunk.
Carter & Son	"	Ten new pit-cars.
Theo. Altschaffee	"	New smoke stack erected.
Dover Coal Co.....	"	Six new houses built for miners.
A. F. Kreese	"	Air-shaft sunk.
Fred. Krantz	"	Air-shaft sunk.
Lexington Coal Co.....	"	Six hundred feet of main entry widened at Riverton No. 1, and double tracks laid therein. New air-shaft 7×7 sunk at head of works at Grady mine, entry widened, and double track put down. New furnace built at Seawell mine, and retimbered, air-shaft, 25 new pit-cars built, and 50 more remodeled.
Salt Fork Coal Co.....	"	Portable engine and pump for use of mine.
Thos. Walton	Linn.....	Rock brush, and entry made higher.
Brookfield Coal Co.	"	Railroad switch built, and shipping connection made with H. & St. Joe R. R.
Landreth & Son	"	New wagon-scale put in, 9 pit-cars rebuilt, one new hoisting rope put in place of old rope, and two new cages.
Levi James	M'con	New horse-power apparatus erected, two new cages built, a platform built 20×16 feet, and a new scale put in.
Kansas and Texas Coal Co.....	"	Two new overcast erected at Mine No. 33, a new lathe and other machinery. Two new hoisting-ropes put to use at Mine No. 46.
Little Pittsburg Coal Co.....	"	Two new hoisting ropes put in place of old ones and drum rebuilt with a new brake.
The Branham Coal Co.....	"	New shaft sunk and equipped.
Black Diamond Coal Co.....	Mongomery	New shaft sunk and equipped.
Alee Carson	Nodiday	Air-shaft sunk.
Emporia Coal Co.....	Putnam.....	Engine-house, hoisting engine, pit head, weigh-house and tipple erected; new ropes, cages, catches and covers for cages supplied. Two new screens, two new pulleys and a new scales; twenty new pit-cars built, and 20 feet extension to smoke-stack.
Rodgers Bros.....	"	Air-shaft sunk.
Mendota Coal Co.....	Rails.....	Air-course enlarged and cleaned at Mine No. 2; new air shaft at Mine No. 1.
Balls County Coal Co.....	"	Hoisting apparatus rebuilt; 10 new pit-cars built.
D. T. Bradley.....	Randolph	Two new hoisting ropes.

ANNUAL REPORT OF THE

TABLE IV—Continued.

Name of company.	County.	Improvements.
John Breckenridge.....	Randolph.....	An overcast erected at Mine No. 3½.
Jones & Davies.....	".....	Engine-house, hoisting engine, pit head, tipple and weigh-house erected; new ropes, cages, catches and covers for cage supplied. New eccentric-shaft sunk and a 10-faw fan erected, stairway built, 20 new pit-cars made and a rail-road switch constructed.
Elliott Coal Co.....	".....	New ventilating fan and engine, two new hoisting ropes, and addition to outside buildings.
Gaffery, Baker Coal Co.....	Ray.....	New jolting screen erected with all equipments.
Lockwood & Lusk Co.....	".....	Recapement-shaft sunk.
Panoe & Cainen Co.....	".....	Tumb-ring shaft and clearing all course.
Joseph Whiteman.....	".....	New shaft sunk and hoisting apparatus removed and rebuilt.
Williams Coal Co.....	".....	Air shaft sunk.
Geo. Wright.....	Schuyler.....	Mine No. 9 newly sunk and the equipment of No. 7 removed and rebuilt at same.
Central Coal Co.....	Vernon.....	New engine and cab erected at Mine No. 16 to haul coal out of dip entry.
Rich Hill Coal Co.....	".....	New boiler erected and an overcast built.
Vernon Coal Co.....	".....	

LITIGATION.

Having mentioned in our last report that a suit was pending in the Circuit Court of Macon county against the Kansas & Texas Coal Co. for a violation of a part of section 7077, Revised Statutes of the State of Missouri, it is but proper to state that the said case was called for trial on the 19th of December, 1895, and dismissed by the judge on account of some technicality in the filing of information. From the decision the prosecuting attorney took exceptions to the ruling of the Court and carried the case to the Supreme Court of the State, where it is now pending.

This strong company, with its numerous lawyers, realizing that they had a better opportunity of fighting the case on a technicality rather than on its merits, adopted this method in preference; for had its attorneys confidence in the justice of the position assumed by the company it would have been far less troublesome and expensive to try the case on its merits and end the controversy.

The mining laws were enacted for the regulation and control of mines and mining operations, because of the extra hazardous conditions existing in underground work and for the protection and safety of the miners employed therein; as their health and life both are largely dependent upon the proper conduct and management of a mine. That these laws should be observed and enforced, a mine inspector was appointed and empowered with the necessary authority for that purpose.

Experience teaches that the authority of the mine inspector is seriously impaired, however, when the miners fail him in their support and co-operation. During the four years of service as mine inspector of this State, this case of the Kansas & Texas Coal Co. is the only one in which I have been forced to resort to the Courts to secure compliance with the mining laws, and my experience in this case has been most trying, not because of the opposition naturally expected and the unpleasant features associated with law suits, but difficulties thrown in my way by the very parties I was attempting to protect. When it is remembered that the mining laws were designed to protect the weak and helpless who may be at the mercy of a strong corporation, how strange it is that with an inspector provided by these same laws to guard the safety and look after interests of such vital importance to the miners; that these same miners are so influenced by their dependence upon these strong companies, that they fear to manifest a dissatisfaction with prevailing conditions in a mine, which are not only contrary to the laws of the State, but which work

injury to their health and subject them to unusual and unnecessary dangers; yet this is a state of affairs that the inspector has had to contend with.

In my efforts to compel this coal company observe the mining laws in order that the miner might be the better protected in life and health, imagine my astonishment to find a number of miners in the court room ready to testify on behalf of the coal company and against me, while I was at the time engaged in honest endeavor to protect them from unlawful surroundings placed about them by the company, they were ready to testify for and thus swear away my claim to their unjust treatment.

I secured but two witnesses from the great number of miners who were required to simply testify to facts; these two men were promptly discharged by the Superintendent of the Coal Co. Of course the witnesses from among the miners who were to testify in behalf of the company were after soft jobs in the mine, while others like the superintendent would testify in behalf of the company because of a lack of practical mining experience, and an acquaintance with the true application of mining terms.

It cannot be disputed that too many accidents take place that should not occur; not that there have been more of late years than formerly, but because there should be less by reason of additional safeguards that are provided by law and which are disregarded by some companies. Accidents have occurred which could and should have been avoided by practical mine management.

While some of our laws need amending and others are weak, yet no matter what legislation may be had for the benefit of the miner, unless the miner supports the inspector in the discharge of his duty, laws will avail nothing, for as weak as some of our laws are they are not weaker than the miners in some of our mines.

On my visit to many mines my experience has been, where defects were found and complaint made me by miners as to the evil effects of the same, that when I asked the privilege of using their names in the event that I failed to secure the necessary remedies, I was in nearly every instance refused; all of which tends to place the inspector at a disadvantage. I shall, however, use my best efforts to secure the greatest safety and the best possible sanitary condition for our miners.

MINE VENTILATION BY MECHANICAL APPLIANCES.

The subject of mine ventilation is one that should be studied by every mine official and miner as well, for the safety of a mine, especially with reference to its ventilation and sanitation, depends not only upon the competency of the mine boss and mine manager, but upon the decency and fair dealing of every one working in a mine whatever his position may be. Ventilation is the most important feature connected with the successful operation of a mine. It is about as impracticable to imagine a boat can be floated without water as to imagine that a mine can be successfully operated without the aid of a sound and practicable system of ventilation. Ventilation in mines is now very generally produced by fans. In times past the furnace was extensively employed for this purpose, but in all shallow mines this proved to be a fickle, unreliable and insufficient producer of air currents and has been gradually superceded by the fan as a superior appliance for the creation and maintenance of regular and steady currents of air. With the knowledge now extant regarding the laws of mine ventilation, it is astonishing that the ventilation of shallow mines should be attempted by a furnace after it has been demonstrated in so many instances that the fan is more effective, more reliable and in many ways safest. The furnace is affected in its operation by changes in the temperature of the atmosphere on the surface, which are at times sudden and extreme, and the air current in a mine most necessarily vary as often as these changes occur.

The furnace demands the constant attention of the man whose duty it is to look after it, his position and location subjects him to contact with the combined impurities absorbed by the air current in its torturous course through the mine; then again the volume and velocity of the air is dependent upon the energy and attention of this furnace man; should he neglect his duties, it requires the expenditure of more power, to say nothing of the delay in restoring the current to its normal condition and the discomforture of the miners in the meantime. The fan is not subject to fluctuations of this kind; it is not directly affected by atmospheric changes, neither is the speed of the current or its volume subject to variations; but a steady and constant stream of air flows through the air courses and is subject only to the mechanical regulation of the fan's revolutions.

Furnaces are often built with a capacity largely in excess of immediate demands, and it is a wise provision, for even then as the mine is gradually developed and extended, the time arrives when the

capacity of the furnace is found too limited, and nothing remains but to demolish the old one and replace it with a new one.

The fan always possesses a reserve of power, which can be brought out and utilized instantly by simply giving it more steam and increasing its speed, and as a general rule it may be said that the capacity of the fan for passing the required volume of air is only limited by the size of the airways, because of its possibilities by an increase of speed. In the matter of expense attending the cost of running, the fan has a decided advantage over the furnace, as in most shaft mines the air-shaft is so located that steam can be carried to the fan from the boilers used for hoisting, thus doing away with the employment of a special attendant. The saving in the running expense of the fan is by no means the most important advantage it possesses. It is a part of good mine management to have a surplus of ventilating power on hand at all times, to be used in time of need.

Ventilating fans with engines are now built and sold at less cost than a first-class furnace can be built for, so that it is unnecessary to consider the items of first cost, when comparing the relative merits of the fan and furnace. In the ventilation of a mine there are several sources of resistance presented to the passage of the air; 1st, that which is presented by the atmosphere to the discharge and diffusion of the air; 2d, that which is presented by the fan; 3rd, that which is presented by the airways in the mine. The resistance presented by these three sources increase and decrease in proportion with the square of the velocity of the air-current.

The first resistance should be reduced to a minimum, by having the area of the discharge outlet at the blades of the fan, so adjusted as to suit the necessities of both the air volume and its velocity on leaving the blades.

Second, the fan should be of sufficient dimensions to pass the maximum quantity of air required for the ventilation of the mine with as little resistance as possible.

Third, the resistance of the mine should be minimized by the enlarging of air-ways, and by dividing the ventilative volume into separate divisions or splits.

To properly understand the distribution of air through the mine is the science of ventilation; even at this late date of modern improvement in the science of mine ventilation it is far from being thoroughly understood by a great many who have charge of mines in this State. Why this is so I cannot furnish a good reason, for abundant opportunities are always present, which if grasped and followed up would enable the practical and progressive to thoroughly study and master the sub-

ject. In ventilating a mine it is absolutely necessary that the air be carried to the working places and properly distributed. To have the air come down one shaft and travel the air-ways and entries in a large volume, whilst at the working face there is scarcely sufficient air to support combustion in a single light, is not ventilation; such management is reckless and criminal, and in the end will lead to disastrous results. However efficient a ventilating fan may be or powerful the motive power, the combined efforts may be defeated by defective doors and stoppings, choked up air-ways, injudicious splittings, incompetent management, or by other defects.

Ventilation stands pre-eminent in its demands upon mine managers, as the miner spends a large portion of his life in the mines, his health, comfort and life is largely dependent upon ventilation; if this is not properly furnished he must breathe an atmosphere impregnated with the exhalations of the human, the animal, the gases indigenous to the mine earth and those generated by the combustion of powder used in blasting; all of these tend incessantly to envelope him in an atmosphere altogether unfit for respiration.

The air of no mine is as pure and fresh as the air on the surface; this being the case, how impure must it be in an ill-ventilated mine; but while it is impossible to convey the air through a mine in as pure and fresh condition as it is found on the surface, owing to the impurities which it gathers in its passage through mines, yet, under a practical and careful management, great improvements may be made in the sanitary condition of many mines in this State. The miner, by reason of his arduous labor, his long confinement day after day in the dark confines of a mine, shut out from the light of the sun and denied the pure fresh air of heaven so common to man, should have as fresh and as pure air to inhale as it is possible to furnish, and plenty of it. When God breathed into man the breath of life, He gave him good pure air to breathe. It was not given grudgingly, but was given in abundance, and the more we know of its properties, the more we value it, for it is one of the greatest blessings of God to mankind, and humanity should demand of every mine owner in this State and every other state the employment of only the most competent and practical men for the underground management and control of the mines.

MINE MANAGEMENT.

The object in creating the position of State Mine Inspector was for the purpose of securing compliance with the mining laws and the better protection of the health and lives of miners. My experience in the position for the past four years has developed still further duties

in order to accomplish the aims first mentioned; due to the many crude methods in use which are the result of a false economy, or from a lack of practical mining experience, by those instructed with mine supervision, I have found it indispensably necessary to act as an instructor and advisor in numerous instances and I trust with good results. The benefits derived from mine legislation and State Mine Inspectors have of late years brought about very decided improvements in the way of safeguards against accidents and the betterment of mining operations in general, especially so in raising the standard of qualification and capacity of mine officials. The coal business having expanded so rapidly, there are many men who have worked themselves into positions connected with the underground operations of a mine that are incapable and out of place, and in some instances as sadly lacking in qualifications as they were 25 years ago; these require constant watching and much instruction.

It is evident that the mine manager who is wanting in practical experience, unacquainted with the principles pertaining to ventilation, and unfamiliar with latest and most approved methods and appliances employed in mining, cannot secure the best results economically or otherwise for the mine owner, or insure that degree of comfort and safety to the mines that the situation and the circumstances demand of him.

There are several points to be kept in view in the matter of mine management, namely: how to operate the mine efficiently, practically and economically; how to manage the mine and the men properly, and with safety and comfort to the latter. To a practical and a competent mine manager there are many things which must suggest themselves to him that are not embodied in the mining law; suggestions that cannot be other than beneficial to those working in the mine. If the manager has the safety and comfort of the men under his charge at heart, he will not always be doing this or that merely because the law demands it, but on the alert, watching dangers and endeavoring to remove them, instead of searching for technicalities in order to avoid complying with the mining law, to save a few dollars in expense at the sacrifice of the comfort, safety and often lives of the miners. While it is very gratifying to know that there has been of late years a steady improvement in the efficiency of the management of mines, yet as long as incompetent men are employed no great advancement can be expected.

A mine superintendent who takes so little interest in informing himself of the progress which has been made in mining, or who is so stupid as to think he knows it all, and that there is nothing more to be

learned in the operation of a mine, while at the same time the men under him suffer for the want of a pure air to breathe, because of poor ventilation, defective doors, stoppings, crooked entries, poorly made and badly kept up roadways; also, squeezes involving the loss of coal, great expense in repairs and frequent accidents all conspire to prove his management to be a miserable failure.

The superintendent of a mine should be practical and competent; in fact, the responsibility for the economical and safe operation and management of extensive inside workings should not be delegated to any but practical and competent men. It is not necessary that they have a college education, but it is important that they have sufficient practical knowledge and native ability to keep the mine in a good sanitary condition, and secure the best results with safety to the mine and miner. He should have sufficient ambition to take advantage of opportunities for improving the mine, as these opportunities are continually presented in all mines.

PRESENT CONDITION OF THE MINES.

The standard of the American miner is considerably lower now than in years gone by. In taking a retrospective view of the miner of 20 years ago and comparing him with the class of producers of the present day the comparison is very much in favor of the former. I can assign various reasons for the change, but whether my reasons are correct or not, there is no disguising the fact that the miners of today by comparison have deteriorated; they are also inferior professionally, socially and morally. I can remember the time when nearly all the miners were made up of English speaking people, that is, English, Irish, Scotch, Welsh and native Americans, and no better class of miners could be found anywhere. They were practical, patriotic citizens, industrious, manly, high-spirited, good providers and with few exceptions, sober. But coal mining has changed in many respects of late years, the small operators have given place to the syndicates and the corporations.

Large coal companies have been formed with their interests extending over several states; the law of competition calls for cheaper coal; this reduces the price of mining and strikes, and suspensions are the result. The numerous reductions of the price for mining which has taken place in the last 20 years has forced down the earnings of the miner to such a low figure that in order to protect themselves and

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ing wages for their labor, they have been compelled to strike at their employers; this extreme defense in many instances, to defeat the practical miner, imported corporations, as the miners, to work them in some of their mines at present.

The claim is made that the negro miners are more easily subdued, less trouble, live cheaper and will work for less wages than the miners. There are also other races, such as Poles, Huns and Germans, who have entered the negro, coming in contact with English speaking miners, have forced the latter down to their level, and these, after with good living wages, or take the alternative of quitting the mines; this many of the best miners have resolved to do in the last few years. Some of them have gone to farming and other avocations, but many of our young miners left for the cities, where they pick up other trades or embark in some other line of business, leaving the negroes and the Huns to do the coal mining. The negroes are very inferior miners as compared with the white miners; they are awkward, impractical and unprofitable, and are only employed in time of strikes and used as weapons to defeat the better class of miners when striking in defense of their rights and against a reduction in wages. I am safe in the statement that every operator in this State who has imported negroes to work their mines have lost money by the operation, but the strikes were virtually broken up, and hence the purpose was accomplished. The other races named are not any further advanced in the skill of mining than the negroes, and, as citizens, are their inferior; but the object of their importation, like that of the negro, has aided in breaking the force of strikes and the reduction in mining prices to a figure far below former experience. Besides depreciating the value of labor by the importation of the class of miners mentioned, mining towns which were formerly prosperous have been demoralized and ruined by driving the better class of citizens away and substituting the lowest grade of humanity. The mines suffer by being worked with unskillful hands, wherein thousands of tons of coal are lost every year, partly by the caving of rooms and shooting the coal into slack. The standing of the Missouri coal has been lowered in the markets owing to the stupid methods of mining and loading, and as a consequence a reduction in the price of its coal. Fatalities are on the increase and directly due to the inferior class of labor now being employed.

STRIKES.

Strikes are to be deplored from whatever point of view they may be regarded, for in nearly every instance they work an injury to the miners engaged in them and oftentimes prove disastrous to the operator. Far better are the results from a cultivation of that friendly feeling which should exist between employer and employe, and where reason and justice supplants avarice and prejudice. All grievances under such a state of feeling can the more readily be righted, because there would not exist that want of confidence so necessary in any discussion involving the rights of one or the other. Let confidence in one or the other be destroyed and understandings are rarely arrived at without a resort to extreme measures.

Operators have much to gain in possessing the good will and confidence of their miners and much to lose when either are destroyed; where there exists a lack of faith in the fair dealing of one with the other, the impression will prevail, right or wrong, that an undue advantage is sought and a slight error conforms an imaginary wrong into such fearful proportions that strikes and suspensions follow. When a real enmity is aroused between employer and employe as a result of a strike, which ever side wins vows vengeance against the other, and the opportunity to avenge is only too eagerly accepted. At best such a state of affairs is but an armed truce, to be broken at the first favorable opportunity to secure an advantage or work an injury.

The prime cause, especially of late years, for the lack of good feeling or of that mutual interest formerly existing between operator and miner, is due to the organization of large corporations which employ a great number of men. Formerly our coal operators were individuals or small companies composed of a few individuals, employing comparatively a small number of men; then it was that operator was personally acquainted with each miner employed, and any grievance on the part of a miner could be thoroughly discussed between them. The difficulties with which an operator had to contend were more generally understood by the miner and the more readily appreciated because of such knowledge, for these reasons there was created that community of interests that cannot well be maintained without like or similar existing conditions.

Strikes were less frequent because of the better understanding of mutual interests; reason and justice born of this fellow feeling avoided

the difficulties which now precipitate strikes. With the large corporations too generally these conditions are reversed; usually their general offices and officers are far distant from the mines. The most unreasonable demands made of both officers and miners are from those who seldom if ever see inside of a mine, know comparatively nothing of mining or mining operations and are necessarily unable to appreciate or comprehend what is embraced in the life of a coal miner; for why should a stockholder know these things? It is not even comfortable for him to contemplate the hazardous occupation and many deprivations the miner experiences, to say nothing of personal contact or acquaintance with them. It is this lack of touch or bond of sympathy once existing between the small operator and his miners, and which is unknown to the stockholder that must explain the revolution of feeling on the part of the miners toward the large operators. The introduction of large concerns with numerous stockholders has caused a parting of the ways and the influence of mutual interests are being felt less and less each succeeding year.

In this connection I am impressed with the responsibilities and difficulties that the principal officers of large coal corporations have to contend with. I know that there are many instances in which their trying positions are not duly appreciated or recognized by either stockholder or miner. In the conscientious discharge of duty they are placed between two fires—upon the one hand the miner with his pre-conceived views of the heartlessness of corporations generally, regards all propositions with suspicion, and upon the other hand the stockholders who are unfamiliar with mines and mining conditions, and interested only in the size or amount of their dividend, and should their expectations in this direction fail of realization, no matter from what cause, the tendency is to vote a curtailment of expenses, never contemplating apparently, the often vital interests involved by such demand. Unfortunately too many stockholders seemingly regard a coal mine as a huge machine to grind out coal and dividends, ignoring the fact that their mines from one end of them to the other are pulsating with energies propelled by the very life blood of humanity, a humanity lost sight of in the eager pursuit of gain, forgetting that they are the same creatures that the Creator of the universe referred to as His heritage.

I intreat the miners of our State to avoid strikes if possible, and exhaust all honorable means and every reasonable effort before resorting to a strike, but in the event such cannot be avoided, I earnestly advise that the miners trust to the moral influence of the community for justice rather than to fire and blood-shed.

I have thus referred to strikes from the best of motives, with an apprehension that under existing conditions large possibilities for trouble exist if men are imprudent and unjust in their demands. Certain conditions produce certain results; large corporations with immense resources and influence and employing great numbers of men necessitates organized labor in labor's defense, as it is the legitimate fruit and natural offspring of such corporations. I am convinced that no combine, trust or syndicate was ever organized, the ultimate object of which was not the undoing or overthrow of smaller concerns or to enthroned itself as the arbiter of labor's compensation. Experience teaches that the stronger such organizations become the greater control do they exercise over labor, railroads and legislation.

It is to be hoped that in our great State we may experience as great freedom from the influence of such organizations as we have in the past, and that our coal operators and miners may exercise such justice and prudence as will make unnecessary for the coming year any reference to strikes.

ACCIDENTS.

During the past year there were 36 accidents in our coal mines, of which 16 were fatal and 20 were non-fatal. Compared with the previous year there were three more fatal and five more non-fatal accidents.

The number of tons of coal mined for each life lost was 151,272.

Accidents were due to the following causes: Asphyxiation, blasts, falls of coal, mine cars, explosions, cages and falls of roof.

Falls of roof as usual claims the largest number of victims, as nearly 60 per cent of all the accidents of last year are due to this one cause. The blame for all this cannot be confined to any one reason; for judging from a study of the verdicts rendered and remarks connected with the detailed statements made to this office concerning the respective accidents, one must conclude that the miners themselves are largely to blame; but whether this is the result of indifference, carelessness or a want of practical mining experience is not all cases plain.

Heavy charges of powder made necessary where the unlawful practice of shooting off the solid is permitted, has much to do with weakening the roof and rendering it unsafe, props from same cause are knocked out and the resetting of which often acts as a trap in which the miner is caught. Mine managers can aid in a reduction of this class of accident by exercising greater diligence in the super-

vision of rooms, greater care in the selection of the miners to be employed and a closer observance of the mining laws.

Shot-firers are paid at the rate of a full day's work; they are supposed to occupy the time necessary in the performance of their work that their instructions demand and prudence requires. The pit-boss cannot work day and night, so that after giving the shot-firer his instructions for the night, the latter is left in the mine alone and is virtually his own boss. The temptation under these conditions to crowd the work of hours into a few moments proves too great for him and at great personal risk to himself he accepts the chances.

Actual experience in this State has demonstrated to what extremes this can be carried, where two shot-firers are known to have fired 85 shots in 12 minutes, and had not an explosion interfered with their work, they would have fired 101 shots, which had been prepared, in 16 minutes, thus earning \$2.50 each, or the pay for a day's work in 16 minutes. This reckless work, however, cost the lives of both men engaged in it and wrecked the mine.

This state of affairs called for a prompt remedy and immediate action. The superintendent of the Rich Hill Coal Mining Co. called his foremen, gasmen and shot-firers together, and after fully discussing the matter and the changes necessary to secure life and property against such unauthorized and imprudent conduct, formulated the following rules:

NOTICE TO MINERS AND SHOT-FIRERS.

The following rules governing shot-firing will be followed in the mines of this company:

- 1st. *One shot only* allowed in one place at noon.
- 2d. *Two shots only* allowed in a room or entry at night.
- 3d. In each place, where two shots are to be fired at night, the miner will make one fuse one foot shorter than the other and mark the short length.
- 4th. Where two shots are to be fired in one place there *must* be no other shot lit until the first two have gone off and smoke cleared away somewhat.
- 5th. Shot-firers not to enter the mine until 11:30 a. m. and *no* shot to be fired until 12 o'clock. Shot-firers will not enter the mine in the evening *until six o'clock*.
- 6th. All miners and other employees must arrange to be out of the mine at 12 o'clock m. and 6 o'clock p. m. sharp.
- 7th. Any shot that is, in the judgment of the shot-firer, unsafe, and which he considers might cause a windy shot is not to be fired under any circumstances and the same to be reported to the mine foreman. Approved.

W. B. WILLIAMS, Superintendent.

R. M. McDOWELL, General Manager.

Since the adoption of the foregoing rules, they have been strictly enforced with most satisfactory results. Having visited the mines *since these rules were posted*, I learned that the practice of firing at

noon was about abandoned, and that shots were being fired at night only, the good resulting from this being plainly observed in the improved condition of the mine and a better atmosphere for the miner to work in. Shot-firers complying strictly with these rules will afford small opportunity for a repetition of the disasters of the past year.

BARTON COUNTY.

On Tuesday evening, the 17th of last December, Edward Jones, while acting in the capacity of shot-firer at Mine No. 3 of the Wear Coal Co., at Vernon, was found dead by the other shot-firer at the face of the third northwest entry. The two shot-firers went down the mine together to fire the shots prepared by the miners during the day. Mr. Jones, the man found dead, had fired all the shots in the south entries on the west side, all the shots in the main entry as far around as the third north, together with all of the room shots on the back entry of the third north, and had also fired shots in the three outside rooms in the third north front cross entry, there being only four rooms working in that entry. There were three shots made ready in the inside room and two large shots at face of the cross-entry.

Judging from the surroundings, it appeared that he fired the two main-entry shots, then the three shots in the inside room; this room was new and only 20 feet off the cross entry, and the evidence shows that he lighted all the three shots at once. After he had lighted the shots he went out and into one of the outside rooms to wait until they fired. Two of the room shots exploded, leaving one in the room that had missed. Without waiting long enough for the smoke to cool, he evidently rushed back to get the third shot off. After scraping away some coal and dust that had been blown by one of the room shots over the mouth of the hole of the shot that still remained unfired in the room, he put a new squib in the hole, and by this time he was gradually becoming overcome by smoke and evidently tried to get out in the fresh air, but on coming to the cross-entry, instead of turning to the left as he should have done to have reached fresh air, he turned toward the face of the entry, where the smoke was already very hot from the two large shots that had been fired there. He apparently stumbled along the direction indicated until he fell forward on his face, in which position he was found a few minutes later by the other shot-firer, dead, but yet warm, with his cap on his head and his lamp still burning.

He was 22 years of age and unmarried; had been employed as shot-firer at this mine about five months and was considered a careful

and pains-taking shot-firer, and from all the evidence and circumstances surrounding the accident, this young man lost his life in an effort to rush through in a few moments work that which should have taken hours, and his carelessness in going back without waiting long enough for the smoke to become cool. Coroner's verdict was as follows: That he came to his death by suffocation, caused by powder smoke, and exonerate the company from any blame.

BATES COUNTY.

Geo. Donaldson, employed by the Rich Hill Coal & Mining Co. as shot-firer at mine No. 15, was killed at said mine on the 11th of December, 1895, by an explosion. Full particulars of this explosion will be found under head of explosions in this report. Donaldson was 50 years of age, married and had one adopted child. At the coroner's inquest the jury brought in the following verdict: That deceased came to his death by suffocation in mine No. 15, caused by an explosion in said mine, resulting from too rapid shot-firing.

Richard Jones, also shot-firer, employed by the same company, and at the same mine as Donaldson, was killed in the same explosion. A detailed account and a full description of the explosion is given in an article written on the explosion and published in this report. Jones was 25 years of age, married and had two children. Jones was alive when found and lived 70 hours after the accident, but was unconscious until he died. No inquest held.

Robert Girth and Josiah Whitehead, employed as shot-firers at mine No. 19, Rich Hill Coal Co., were killed at said mine October 17, 1895, by an explosion. Full particulars of the accident will be found in an article written on the cause and effect of the explosion which is published in this report. Mr. Girth was 21 years of age and unmarried. Whitehead was 63 years of age, a widower with one child. The coroner after examining a few witnesses did not think it necessary to empanel a jury, and gave his verdict that deceased came to his death by asphyxiation.

Wm. Suton, a trapper employed at mine No. 19, Rich Hill Coal Company, was killed February 24, 1896, by the descending of the cage. The deceased and his father and brother went down the shaft on the first cage after dinner, when at the bottom, the deceased stepped off the cage on the north side, while his father and brother got off on the south side; the boy lit his lamp and attempted to cross the shaft bottom by going under the cage instead of going around the traveling way, which was made especially for the use of men to pass from one side of the shaft to the other without going under or over the cage,

and in doing so was caught by the descending cage and killed. His father called on him not to cross, but he paid no heed to him. It is strictly against the rules to cross the shaft bottoms under or over the cages, and printed instruction to that effect are posted at the bottom of the shaft. This boy was taken into the mine at a very tender age, being only 11 years at the time of his death. On investigation I found that the boy had told the pit boss that he was 14 years of age before he hired him, and being very large of his age no one had any suspicion to the contrary. In cases of this kind, what is to be done? how is a mine boss or the mine inspector going to ascertain a boy's age? we can't get the facts from the father or the boy, nor is there a law to go any further in the matter. In going through the mines I often come across some very small boys, but if they are not higher than their dinner pail when asked their ages, they are always 14 years of age; they are smart and up to every trick. I never fail to instruct every pit boss on my visits of inspection not to hire any boy until they furnish ample proof that the boy is of a legal age to work in the mine.

Otto Wood, a miner working for the Rich Hill Coal and Mining Co. at Mine No. 9, was killed on the 28th of February, 1896. Deceased was 25 years of age and unmarried. Mr. Wood was working at the face of his room loading coal, when a piece of slate fell on him, crushing him down. His partner came to his rescue at once, removed the fallen slate from the injured man, and he was at once taken to his home and medical aid sent for, but he expired just as the doctor arrived. The doctor attributed the unfortunate man's death to internal injuries, as he found no bones broken nor serious external injuries. The room in which deceased was working was well propped, the roof was good and to all appearances in a safe condition, and the accident may be termed an unavoidable one. No inquest held.

HENRY COUNTY.

John Blanchard was killed at H. H. Stephens mine on the 4th of October, 1895. He was 18 years of age and single. This boy was not working in this mine, nor had he any business or right in the mine. It seems that he went into the mine in company with two strangers, and while making a trip to the face of the mine a piece of slate fell on the deceased and crushed him to the ground. The other two strangers walking one in front of him and the other behind him escaped unhurt. He was taken out immediately and sent to his home at Bloomington, and medical aid was sent for, but to no purpose, as he died on his way home. No inquest held. While this accident happened in the mine,

yet I hardly class it as a mine accident, because he was not only not employed, but visited the mine without right or authority.

MACON COUNTY.

Joseph Busiliana, a miner employed at mine No. 46, Kansas & Texas Coal Co., was instantly killed June 16, 1895, by a fall of roof. He was 30 years of age and unmarried.

Deceased it was learned had fired a shot just before the usual time for leaving the mine; but in order to see the result of same went into his room to make an examination when a part of the roof loosened by the shot fell on him crushing the life out of him. The unlawful method practiced in this mine—that of shooting off of the solid—has much to do with accidents of this kind. Shots on the solid are necessarily more heavily loaded, and when there exists a treacherous roof the difficulties and dangers are increased by the use of heavy charges of powder. The tendency to overload in order to bring down a good body of coal is very general, but when there is added to this danger a lack of experience or a want of judgment in locating a shot, the results are often very serious and roof and props suffer. The deceased realizing possibly the effects of his shot upon his poor roof returned to his room to examine his props when caught.

The law requires this company to employ shot-firers and doubtless this man's life would have been spared had it observed the law. It is a serious thing when a company deliberately sets at defiance a law of the State, and compels the Inspector to bring suit in order to secure its observance.

Wm. Smith, employed by the Little Pittsburgh Coal Co., was killed December 28, 1895, by a fall of roof. Deceased and another man were employed as night road men to take down loose rocks, clean up falls and do the timbering. They had finished their work for the night, and were separated; they took opposite directions to see that the roads were clear of falls for the day shift before they went home. They had not been separated very long before Mr. Johnson, one of the two, finished his work and returned to their usual place of meeting to wait for Mr. Smith, but as the latter did not come, Johnson started to look for him, finding him under a fall of rock. After finding that he was dead and that he could not render him any assistance nor remove the rock, there being no one else in the mine, he went to the bottom of the shaft and called for help, which was responded to immediately. It was found that the right arm and one leg of the deceased was badly broken in several places and life completely crushed out. On close investigation the circumstances surrounding the accident on my visit

to the mine, I am convinced that the deceased came across a small fall of dirt at the spot where he was killed, and that he stopped to clean it when the roof fell on him. He was most completely covered when found. Deceased was 32 years of age, married and had one child. Coroner's verdict was that he came to his death by a fall of rock.

Tony Row, a miner employed by the Little Pittsburgh Coal Co., was instantly killed March 18, 1896. Deceased was working in room with his father and it is evident the accident occurred through neglect in not taking proper care of their room. The mine foreman was present helping the deceased to secure the room when the accident happened, and had a very narrow escape himself. The roof at this mine is of a very friable nature and requires the greatest of care to keep the same secured with timber. The records show and prove that the greatest of care and every precaution had been taken by the management to prevent accidents, for while the mine is the oldest in the State now in operation, and has and is yet a large producer, the first fatal accident in the history of the mine occurred on the 28th of last December, and this is the second one experienced. Deceased was 19 years of age and unmarried. The coroner's verdict was that deceased came to his death by the falling of rock, and that no one was to blame.

VERNON COUNTY.

Cornelius Charon, a miner employed at Mine No. 8, Central Coal Co., was killed December 31 by a fall of the roof in his room. The deceased and his partner had fired some shots the night before which had knocked out some props, and the first work attempted next morning was to reset them. Mr. Lewis, the partner of deceased, went out of the room after another prop, and returning with one that was too long, Lewis started to cut some of it off with an axe, Mr. Charon holding the other end down with his foot, when the rock gave away and fell on Charon, knocking him down. In falling his head fell on the prop and the rock on top of his head, mashing it flat. Deceased was 32 years of age and unmarried. The coroner's verdict was accidental death.

Frank Jones (colored), employed at Mine No. 8 of the Central Coal and Coke Co., was fatally injured on May 19, 1896. Deceased was 55 years of age and single. Mr. Jones was on his knees mining off a shot when a slab of slate fell on him, injuring him internally from which he died six hours later. The coroner did not think it necessary to hold an inquest.

Geo. Keegan, a cager, employed at Mine No. 7 of the Central Coal and Coke Co., was killed December 19, 1895, by being caught between

the cage and shaft timber. The deceased had run a loaded car down on the cage and belled or signaled it away. Noticing one end of the car off the track he went around on the other side of the shaft to put it on without giving the signal to stop, and while he was in the act of lifting the car the cage started away and caught him between the curbing of the shaft crushing him terribly. He died in thirty minutes. Frank Samples and Harry Ellis were witnesses of the accident and pulled Keegan off the cage immediately after the accident. Deceased was a single man about 28 years of age. The coroner's verdict was accidental death with no one to blame.

John Smith, a miner employed at mine No. 8 of the Central Coal & Coke Co., was instantly killed January 2, 1896. Mr. Smith was 27 years of age, married and had three children. Deceased was taking down some brushing on one of the entries and was in a hurry to rush the work through. There were a number of props set under some loose slate and he went under to knock them out much against the protest of his partner, and while so engaged the slate fell and caught him before he could get away, killing him instantly. The coroner's verdict was accidental death.

In this record of accidents it is an unpleasant duty to be compelled to note three fatal accidents in so short a time occurring in mine No. 8 of the Central Coal & Coke Co. That which makes this unpleasant, aside from the loss of life, is the fact that Mr. John Mackie, the foreman of the mine, is one of the most practical, conscientious and pains-taking men occupying such position to be found in the State. I have never failed in any visit to the mine to find him at his post of duty and carefully guarding the interests of both the men and his company. While these accidents were of the nature common to mines and are to be classed as unavoidable, yet Mr. Mackie could not take to heart more keenly the sadness of occurrences had they resulted from some neglect of his own.

BATES COUNTY.

On the evening of October 17, 1895, there was an explosion at mine No. 19, Rich Hill Coal and Mining Company. After the miners had finished their day's work and gone out of the mine, two shot-firers, Josiah Whitehead and Robert Girth, repaired to the bottom and immediately entered upon their duties firing the shots prepared by the miners during the day. Barely had these two men commenced work when an explosion takes place resulting in death to the two shot-firers, the killing of three mules and considerable damage to the mine.

This mine is located five miles northwest of Rich Hill, and is the last opened by the Rich Hill Coal Company in the series of mines operated in that locality. The shaft was sunk to a depth of 105 feet in February 1895, but not until the early part of June did the shipment of coal commence.

At the time of the accident 80 men were employed; the capacity of the mine at the time, however, was 500 tons per day.

The mine was practically opened, operated and well ventilated. Its equipment in the way of machinery and other appliances for the safe, convenient and economical working of the mine was first-class. An escapement shaft had been sunk and preparations were being made to erect a large fan to be located on top of this shaft; however, at the time of the explosion, ventilation was furnished by an eight-foot fan placed over an air-chamber of 28 feet area, and which was partitioned off one side of the hoisting shaft. The mine was operated on the double entry pillar and room plan; the ventilative current of air was conducted around the workings in two currents; one current being conducted to the north side of the mine, while the other current was passed to the south side, the two uniting again at the bottom of the up-cast.

When the explosion occurred, I was in a distant part of the State inspecting mines, and was thus prevented from reaching the scene of the accident until the morning of the 19th. I at once proceeded to make a careful investigation of the cause and the damage done by the explosion. I was kindly assisted by Mr. W. B. Williams, general superintendent, Mr. James Price, mine foreman, and Mr. Mark Pearson, a miner of practical experience. After entering the mine we discovered that the explosion was quite limited in its extent, as it reached only from the first southwest entry across the shaft bottom, to the mouth of the first northwest entry, covering a distance of not more than 300 feet, beyond which points no further damage by the explosion was noticeable. On the north side no shots had been fired on the evening of the accident.

Owing to the wreckage of doors and stoppings and the consequent difficulty in properly conducting the air, it necessitated our employment of the safety lamp in making the investigation. Careful examination and search was made to detect the presence of gas, but at no point was it to be found.

It developed during our investigation that the shot-firers accompanied each other to the south side where they both commenced their work; that they began firing on the first and second southwest entries on the first of the air and continued firing in the direction the air was

traveling instead of against it, a proceeding in direct violation of the rules and instructions given by the company.

We further found that 11 shots in all were fired that evening, 9 of which we located on the first and second southwest entries. We also discovered that the cause leading to the explosion was in the main due to the firing of over-charged shots, of which two were in the first southwest entry and one in a room near by. These three shots left every indication that they were windy or shots over-charged with powder and badly prepared; that these shots were greatly over-charged with powder, there can be no doubt, as the manner in which the fragments of coal liberated had been hurled against the sides and over the roadways could be accounted for from no other reason.

The firing of shots so highly over-charged as these were must have created a great volume of fire and flame and caused an uncommon concussion; which confined as it was to the very limited space occupied by the air in a mine, as to result in blowing out the partitions in the air chamber, carrying away the fan house roof and disabling the fan, a less damage would have been surprising.

With the fan disabled and ventilation suspended the foul air of the mine, rendered still more foul by the powder smoke, the shot-firers were evidently asphyxiated before assistance arrived. The bodies of the two shot-firers were found about three hours after the explosion in the back south entry, approximately 50 feet apart and 150 feet from the shaft bottom; they were each found in a stooping position with their faces downward and without a bruise or burn about them apparently as if asleep. It is estimated that the two men had not been down in the mine five minutes that evening before the explosion took place. The effect of these very heavy shots fired almost simultaneously, two of which being fired from a 12-foot entry, was to fill the air with coal dust, powder smoke and its resultant—carbonic acid gas—together with a more than probable small amount of fire damp liberated by each successive shot, was to my mind product of the elements when ignited to cause an explosion with the result already mentioned. There was no charred or coked dust to be found anywhere in the mine to indicate that coal dust was a factor in the explosion; this is in this instance proof sufficient for me to eliminate coal dust as a cause for this accident.

As already intimated, I attribute the cause of this accident as due primarily to the heavy concussions caused by the three windy or blown out shots in the first southeast entry, and the destruction wrought as attributable to the rushing currents. The greatest force of an explosion in a mine is always found at a distance from its starting point.

The greatest velocity is not necessarily at the point where there exists the greatest heat or explosive energy. For instance, we will suppose an explosion to take place at the face of the first southwest entry, where the conditions are such that there could be no rush of air except from this one point and in but one direction, I believe it would be found that the rush and force of the air current would be greater at some point distant from the face, although the greatest heat and pressure may exist at the face or point of origin where no signs of violence may be observed. The current in this explosion rushed across the shaft bottom to the north side and traveled for 200 feet in that direction before it stopped; then rebounding, retraced a part of its course; thence out the hoisting shaft, doing the damage already described. The rebound or back rush experienced in all mine explosions is caused by the partial vacuum resulting from the cooling of the after damp.

After a careful and pains-taking examination of the mine, and due consideration given all the evidence relating to the explosion, I find nothing calling for a censure of the Rich Hill Coal and Mining Company or its officers for any failure or neglect of duty. There was nothing to indicate the slightest evasion of the mining laws, but to the contrary, every evidence of a complete compliance with the same.

In my judgment, the explosion was due to the too rapid firing of shots with the dangers connected therewith, aggravated by firing with the air current instead of against it. I am also convinced that had these shots been fired one at a time, with a sufficient interval between them to permit the clearing away of the smoke and a restoration of the air current, no explosion would have occurred.

The unfortunate men who lost their lives by this explosion were alone to blame; their safety in this instance was sacrificed by their own acts in taking risks which were not only rash, but contrary to their instructions, duty and practical mining.

On the 11th day of December, 1895, at 5:55 p. m., a disastrous explosion occurred in mine No. 15, owned and operated by the Rich Hill Coal & Mining Co., a company which operates extensively in the States of Missouri, Kansas, Arkansas and the Indian Territory, with its general office in the city of St. Louis.

The explosion was a disastrous one, but a much greater catastrophe would have to be recorded had it not been averted so happily by the absence at the time of 200 miners who had worked all that day in the mine.

James Donaldson and Richard Jones, shot-firers and the only persons in the mine at the time, were killed. Fourteen mules were taken

out dead and the damage to the mine was very great, entailing quite a loss in both time and money.

The mine at the time of the accident had been in operation five years, gave employment to 200 men and had an out-put of 1500 tons daily. The coal was conveyed to the surface through a vertical shaft which was 106 feet deep, 14×7 feet in the clear, divided by partitions into cage ways.

EXPLOSION MINE NO. 15.

The surface plant was conveniently arranged and the machinery and the mechanical appliances for hoisting and ventilating were of ample strength and capacity, evidently constructed with a view not only to the most perfect safety but the most economical method of operating.

The ventilation was produced by a 15-foot fan, which was set near the top of the escapement shaft, and at the time of the accident was exhausting the air from the mine.

The mine was worked on the double entry room and pillar plan, with the main entries running north and south and the cross entries east and west. The ventilating volume of air was divided into five separate currents; the air passed down the main hoisting shaft, at the bottom of which it was split to the north and south. The current conducted to the south traveled to the face of the south entry, where it was split to the east and west cross-entries; from thence the current was passed to the west side and then conveyed to the fan over an air crossing after ventilating that part of the mine. The current on the north side (at the date of the explosion) traveled the north entry until it reached the seventh west entry, at which point it was divided; one part was conducted to the eighth west entry; thence to the face of the north entries before reaching the fifth and sixth east entries. The other part of the current was caused to travel back and ventilate the fifth and sixth northwest entries. The fifth current entered the first west entry on the south side, where it united with the current on the northwest side, returning to the fan shaft over still another air-crossing, at which point the five currents met and formed a volume of air registering 53,875 cubic feet passing per minute, at date of inspection (October 25th) prior to the explosion; the fan at this time was running at a speed of 82 revolutions per minute.

The air courses were all high, wide, clean and roomy. The doors were all made of double lumber well set, properly hung and closed with the air current. All of the permanent stoppings were of the heaviest material, well packed and carefully looked after.

This was not only the most productive mine in the State, but was a model in plan as well as in its practical operation. Nothing appeared to be omitted on the part of the management that was necessary to the health and safety of the employes.

The explosion occurred on Wednesday evening, but I was unable to reach the mine until Friday morning, some forty hours thereafter, for at the time of the accident I was inspecting mines in Putnam county.

Upon arriving at the mine, I at once saw from surface indications that a terrific explosion had taken place. The tower over the pit-head had been blown away; both cages were wrecked; the partitions in the shaft were blown out, and all this lumber, together with that of the slides, lay in a heap in the bottom of the shaft. I learned shortly after my arrival that the two shot-firers had been brought out. Donaldson was dead when found. Jones was alive when found, but unconscious, and so remained until he died—some 48 hours after the accident.

After our descent into the mine the further evidence of an awful explosion was witnessed on all sides. The bottom of the shaft and roadways leading from it were strewn with debris to such an extent as to render them almost impassable. Mine cars loaded with coal had been blown great distances then rent assunder and broken to fragments. Timbers of huge dimensions were carried about, twisted, bent, split and broken apparently with as little difficulty as reeds in the wind. Stoppings which had been built of the heaviest and most substantial material, 7 feet wide, 4 feet high and from 12 to 15 feet through, were so completely destroyed that no trace of them was left to indicate that they ever existed, while all evidence of the many doors which had been hanging was entirely lost. Tool-boxes were ripped up, reduced to atoms and their contents scattered all through the entries.

Starting from the shaft bottom I traveled the south entry to within a short distance of its terminus with the intention of reaching a point from which I could diverge to the locality in which the fatal shots were fired, to ascertain the number of the same and discover the exact point or points where the trouble originated. After traveling for some distance in the direction mentioned my investigation on this side for the day was prevented by the presence of black-damp in such quantity and which became so thick as to make further advance in that direction absolutely dangerous. The ventilation having been destroyed by the wreck of doors and stoppings, a postponement of our investigation was decided upon until such time as the same could be restored.

Retracing our steps to the shaft bottom we then proceeded to an investigation of the main north entry. Immediately after crossing the shaft bottom a fearful sight was presented; here the timbers were blown out, the roof for five feet in thickness had fallen and was piled up on the entry. The approach to the mule stable was almost blocked and all the mules on this side were dead and piled one upon another.

The north side, while showing in the immediate vicinity of the shaft bottom that it had encountered the most powerful and destructive part of the explosion, yet it did not suffer as a whole anything like the south side, and for this reason our progress along the entry was not near so difficult as it was on the other side. Proceeding along this entry we found at the mouth of the fifth east entry a coat belonging to Mr. Donaldson (one of the unfortunate shot-firers) burned to ashes, and near by several kegs of powder, some full and others only partially so; one of the full kegs was found intact with the stopper out and still another keg which had exploded, but how much powder it contained at the time is unknown.

Donaldson's body was found in the second room off of the seventh west entry. Here the props of the room and roof were found covered with charred and coaked coal dust. As yet the point at which the trouble originated had not been located, so we continued on, examining room after room until we arrived at the rooms on the eighth west entry off of the straight north, where we found signs which plainly indicated we had struck the place where the trouble began. The effect of four of the shots fired here was entirely convincing to all present that they were each windy shots very indifferently prepared, misjudged as to the quantity of powder necessary to do the work and highly over-charged. The black-damp and foul air again prevented further progress, so it was decided to postpone our investigation until ventilation was restored by the construction of the doors and stoppings.

In this investigation I was kindly and greatly assisted by Mr. Williams, General Superintendant Alex. McKinnon, mine foreman, Elmer Jones and Robt. Pearson, both practical miners, and Mr. J. W. Marsteller, an assistant in the Department of Labor and Mining Statistics, who came down from Jefferson City especially to assist in the investigation.

Second Investigation. On the 21st day of December a telegram was received at this office from General Superintendant Williams, notifying me that all doors had been replaced, new stoppings built, and that the air was circulating in the mine as it did before the explosion.

I at once started for the mine, arriving there on the morning of December 23d.

I was assisted in this second investigation by General Superintendent Williams, Mr. McKinnon, the mine foreman, George Charron, Henry Myers, Robert Pearson, James Robertson and Elmer Jones, each one of them practical miners of many years' experience, and very familiar with the workings of the mine, having worked in it several years.

Eleven days having intervened since the explosion, and aside from cleaning main entries, timbering, setting doors and building stoppings, no other work had been attempted; so that otherwise the mine was practically in the same condition that it existed immediately after the explosion took place or at date of my last investigation.

The principal object of my last examination was to locate and discover the exact number of shots fired on the evening of the day of the accident, within the space of time the shot-firers were at work, the manner in which the shots had been prepared for firing, and how many were over-charged and windy. Beginning our investigation on the south side, we reached the fifth east entry off the main south, where we located one shot fired as the commencing point for the firing on that side of the mine. On the sixth east we found that 13 shots had been fired, from which point the shot-firers proceeded to the cut off on the southeast entry, where he fired 11 more shots. Having fired all shots prepared on the east side, the shot-firer crossed the south entry to the fifth west entry, where he fired 12 shots; from there he went to the sixth west entry, where he fired 13 shots, making a total of 50 shots fired in 12 minutes (with 16 more remaining on this side unfired when the explosion took place). At the same rate of speed in traveling and firing, Mr. Jones, the shot-firer on the south side, would have fired the remaining shots in four minutes more, and have completed a day's work in 16 minutes; for which the company paid him \$2.50, the pay for a full day's work.

Of the 50 shots fired on the south side, seven of them showed every evidence of being windy shots and greatly overcharged with powder; one of these was fired in a cross-cut and was what is termed a blown-out shot. From the sixth west the shot-firer went to the seventh west and took shelter in the second room on that entry, at which point he was found 21 hours after the explosion, alive but unconscious and entirely free from a bruise or burn.

On the north side we found that Mr. Donaldson, the shot-firer on that side, had fired 35 shots and had 27 more to fire. Commencing on the fifth east entry he fired seven shots, then passing through the

cross-cut to the face, he fired 19 shots in the sixth east; from thence he went to the main north entry and fired two shots and one shot in the back north entry, and thence to the eighth west entry and fired six shots. From the eighth west McDonaldson went to the second room on the seventh west entry for shelter, where he was found six and a half hours after the explosion.

Of the 35 shots fired on the north side, there existed the plainest evidence of 15 over-charged and windy shots.

A large amount of charred and coaked coal dust was found on the coal, props, cross-bars, pit-cars, sides and floor of the mine in the immediate surroundings of the place where Donaldson's body was found.

We found quite a number of shots on the sixth east entry that had been indifferently prepared and evidently greatly over-charged with powder, but not until we reached the second, third and fourth rooms on the eighth west entry did we find sufficient proof to justify us in the conclusion that the starting point of the explosion originated in these rooms.

When we take into consideration the manner in which the coal in the rooms mentioned was liberated and hurled against the sides and neck of the rooms, there can be no doubt that the shots in rooms two, three and four were of that dangerous and serious nature already mentioned. We could not avoid the conclusion judging from the effects produced by the shots fired that the trouble originated here; making its first appearance on the north entry at the mouth of the seventh west entry, from which point it appears to have divided; one part of the explosion traveled north toward the face of the entry, carrying with it the curtains and doors which were hung between the seventh and eighth west entries. Tool boxes with their contents were blown in the same direction and scattered all along the entry. The greatest force, however, was hurled south toward the bottom of the hoisting shaft, confining itself almost entirely to the haulage ways. The main north and south entries were the only entries in the mine that suffered damage, aside from the wrecking of doors on cross-entries and the blowing out of stoppings, as this powerful sweeping force passed on its errant of destruction.

The appearance of everything on the south side indicated that the explosion came from the face of the south entry and traveled toward the hoisting shaft. On the north side everything looked like the explosion must have come from the north face and traveled towards the hoisting shaft, where the two terrific forces met in destructions embrace with just such result as might be expected from a combination of such forces.

This investigation was conducted with naked lights, although we carried with us two safety lamps for the purpose of searching for gas in high and abandoned places and in rooms ahead of cross-cuts, but nowhere was there a trace of gas found.

After this detailed description of the destruction to life and property by the explosion and the minute account of the condition and operation of the mine, the question naturally arises: What was the cause or causes leading to this disastrous explosion?

The evidence of all witnesses testifying before the coroner's jury at the inquest clearly pointed to the excellent condition the mine was in at the time of the accident. Only 46 days before the explosion occurred I made an inspection of this mine, at which time a measurement of the air was taken showing 53,875 cubic feet of air passing per minute, and the same safely and practically distributed. The engineer when questioned stated that the fan was running at about its usual speed when the accident took place.

The impression that the explosion resulted from an accumulation of light carburetted hydrogen gas, or fire-damp, as was argued by some, is not tenable, for the excellent reason that this gas has never been detected in this mine in sufficient quantity to cause the slightest disturbance if ignited, either prior to or since this explosion. The sworn testimony of miners who worked all that day in the mine was that they worked as usual with naked lights, and that there was a free circulation of air passing. The testimony of the gas man, who examined the mine in the early morning of that fatal day, showed that in only two rooms on the south side did he find any trace of gas, and that was in the proportion of one volume of gas to fifteen volumes of air, which would not explode, the gas simply showed an elongation of the flame of the lamp surrounded by a faint halo. Carburetted hydrogen gas is known among miners as fire-damp. It issues from the pores of the coal and roof, and its weight is about half that of common air, the difference in its specific gravity causing it to rise to the highest points in a mine. My numerous inspections of this mine has failed at any time to reveal a trace of this gas, although I have searched for it in the most remote and highest parts of the mine, and also in the abandoned portions of the works.

Neither can this be consistently called a "coal dust" explosion. While coal dust may be considered an element of great danger, and largely instrumental in extending and increasing the power and force of an explosion; in this instance there was not sufficient evidence to show that coal dust played so prominent a part. Only in the vicinity of Donaldson's body was there found any signs of coked coal dust, and

yet at the same time all over the mine on the sides, floor, props, cross-bars and pit-cars coal dust an eighth of an inch thick was deposited and exposed to the action of the explosion. After the firing of 85 shots in 12 minutes' time, with visible evidence that 22 per cent of the same were windy and blown-out shots, it is not unreasonable to assume that the coal dust would be stirred up, set in motion, and be thus generally fitted to that condition which would cause it to burn. Now, as only one point in this mine showed the coked coal dust, and the explosive force travelled some thousands of feet over this haulage way, I fail to see where I have any reasonable grounds to attribute to coal dust any serious influence as an agent in inciting, increasing or extending the force and violence of this explosion.

While it has been shown that *coal dust* may under favorable conditions, serve as an inciting *cause of* the ignition of fire-damp mixtures, and that this mixture is of such nature that in the absence of this *cause*, it would escape ignition; yet it is not proven to my satisfaction to be the destructive factor that many would have us believe.

During the last few years large contributions have been made to our stock of knowledge concerning coal dust explosions. Experiments and investigations along this line have been authorized by several foreign nations and commissions were appointed for the purpose, corporations and individuals have pursued the investigation and prominent mining engineers of Great Britain and the continent have written a vast amount on the subject.

W. N. and J. B. Atkinson, British mine inspectors, after investigating several disastrous explosions between the years 1880 and 1887, became fully convinced that coal dust would not only intensify an explosion of gas, but that the explosion and flame from a blown-out shot would ignite and explode it even when the air was entirely free from gas.

Mr. William Hall, inspector of mines for the Lancaster district, made a series of experiments. His experiments were made in some instances in an abandoned shaft, others in a shaft in process of working. All the conditions were therefore such as would be found in any coal mine.

Mr. Hall sums up the result of his tests as follows:

"Experiments conclusively proved that blasting with gun-powder in dry and dusty mines may cause serious disasters in the entire absence of fire-damp. It is impossible to explain why many of the experiments failed to cause explosions, or ignite the dust, but the fact that at intervals they did occur, justifies the above conclusion."

Sir F. A. Abel carried out experiments with coal dust on a small scale at the request of the Home secretary. He obtained no decisive results regarding the inflammability of coal dust with the air alone, but he discovered the effect of dust as dust, and apart from its inflammability in promoting the inflammation of mixtures of fire-damp and air.

In 1875 and again in 1881 Mr. William Galloway, director of the mines in South Wales, and who was in all probability the first to recognize the influence of coal dust in large explosions, conducted a series of experiments which enabled him to obtain precise results as to the action of coal dust. His experiments were effected by means of tubes, and comparisons were made of the action of the coal dust in a pure atmosphere and in one charged with fire-damp. At first Mr. Galloway was inclined to believe that coal dust in an atmosphere of ordinary pressure and temperature and free from any combustible gas was not inflammable, but should the atmosphere contain but a feeble proportion of gas, an explosion might take place. His latter experiments, however, caused him to reverse his former conclusions, for they showed him that the dust of certain coals might inflame in an atmosphere which was absolutely free from gas and would be sufficient of itself to propagate fire.

The experiments of Messrs. Hall and Clark in the Wynnstay mines, of Morrison and Marreco at the Elswick and Horton mines, Sir F. A. Abel, at the Garwood Hall mine, and the investigations of several Government Commissions all confirmed the results of Mr. Galloway's experiments, with the exception that they claim in an atmosphere free from gas the presence of coal dust is attended by but a very small amount of danger.

The French Fire-damp Commission conducted a number of experiments from which it concluded that certain kinds of coal dust might take fire, but that the propagation of the flame by action of the dust did not take place at great distances, even when the atmosphere contained from two to three per cent of gas. Thus the question of the part coal dust plays in mine explosions is still an open one.

The most comprehensive experimental work in connection with this question, is that of the Prussian Fire Damp Commission, which was conducted under circumstances as nearly analogous to those existing in mines as was possible, and the result of the experiments demonstrated that Mr. Galloway's conclusions were correct, i. e., that coal dust will cause an explosion even though the air be free from gas.

With such evidence confronting them, the leading mining authorities on mines and mining, arrived at the conclusion that coal dust is

an element of very great danger in the mines, and that its consideration in connection with explosions is of primary importance. Notwithstanding this, however, the fact remains that the evidence that coal dust is the chief factor in actual mine explosions is very meagre. But as an agent in increasing accelerating, and intensifying the force and disastrous consequence resulting from an explosion of gas, I am satisfied there is proof enough.

If coal dust is the principal agent in coal mine explosions, what is it that prevents every blown-out shot from producing an explosion? We know that blown-out shots are of every-day occurrence in the mines of the State, and that they are associated with an additional dangerous element arising from the explosion of a very large amount of powder; then if coal dust is so prominent a cause in explosions, it would be only natural (its presence existing in nearly all mines) that on each occurrence of a blown-out shot that an explosion would follow, but the truth is that the number of explosions compared with the number of blown-out or cyclone shots is infinitesimal.

The conditions existing at mine No. 15 at date of accident were exactly of the same nature as on preceding days, and the same methods of firing shots was practiced.

The shot-firers were both considered very competent and practical men. Mr. Donaldson had worked in the mines of Rich Hill for about 14 years, filling positions of trust with entire satisfaction; having been pit-boss, gas-man and shot-firer for some years. Mr. Jones had been firing shots in this mine for two successive years and was regarded as a reliable and careful man.

The mine had been running very near to its full capacity every day for some weeks prior to the explosion, and about the same number of shots had been fired each day, in fact during the noon hour of this fateful day a large number of shots were fired without leaving any suspicious indications or bad results therefrom.

That a large amount of coal dust is stirred up and set in motion by reason of the numerous shots exploded at each firing time there can be no doubt, and if coal dust is the principal factor in explosions as it is thought to be and as demonstrated by the many experiments, and as so fully set forth by the many very eminent authorities on the subject, then I am more than ever perplexed by the unsolved mystery, as to what prevented this mine as well as many of its neighbors, surrounded by like conditions, time and again, from being blown up long since?

With facts like these staring me in the face, I cannot reconcile my views to the theory that attributes such wide and powerful influences

to the action of coal dust as a primary cause in coal mine explosions, and at the same time I am free to admit its agency in assisting and intensifying the elements instrumental in causing disastrous explosions.

After having explained at some length my reasons for not considering this a coal dust explosion, and demonstrated beyond doubt the absence of fire-damp in the mine in detectable quantity, fortified by the sworn testimony of miners employed in the mine on the day of the accident that it was in a safe condition, from my personal knowledge of its condition just prior to, and my investigation immediately after the explosion, I am unable to arrive at any other than the following conclusions:

That the disaster is due mainly to the rapid and successive firing of four heavily charged and badly prepared shots in rooms 2, 3 and 4 in the eighth west off of the north entry.

From the developments in our investigation it was plainly apparent to the experienced and practical eye that any one or all of the six shots in the rooms referred to may have been windy or blown-out shots, but that there were four of them of this nature there can be no manner of doubt. For instance, two of these shots showed that the upper part of the coal had been blown out, while the lower portion remained unbroken, indicating windy shots; in two other shots the coal was blown off near the mouth of the drill-hole, leaving fully three feet of the hole standing, a conclusive proof of blown-out shot.

As has already been stated, the firing was commenced on the last of the air and continued in that direction for the purpose of allowing the powder smoke to be carried away by the air current. In my opinion the tendency of the first shot was to impede the air to a certain extent and each successive shot added to the confusion and stoppage of the ventilative current. The rapid firing of so many over-charged shots not only had the effect of banking up and impeding the progress of the air current, but the combustion of so much powder generated a large amount of carbonic oxide gas, and with the face of the workings very dry, each successive shot raised its cloud of fine coal dust. When we consider the condition of this mine, with its air current brought comparatively to a standstill, its entire space densely packed with coal dust, powder smoke and its legitimate offspring (carbonic oxide gas), and the added probability that with each fracture of the coal by a shot, a small amount of fire-damp may have been liberated; how very favorable the situation with all these sensitive mixtures on hand for an explosion. All that was needed to cause a disaster was supplied by a sheet of flame from the windy shots, and how greedily all combined to work destruction is witnessed in the result.

Powder, when exploded, generates a number of gases, a large percentage of which are of an explosive nature. When a charge of powder is deposited in the solid coal, and the resistance not inferior to the force developed, the gases will mix with the air of a mine and become harmless—a result indicating complete combustion. But if a charge of powder is placed in the coal and the resistance opposed be greatly inferior to the force developed, or in other words, if the shot be greatly over-charged, a large amount of carbonic oxide gas will be formed.

Carbonic oxide gas (or white damp) is the product of incomplete combustion, and will always be found in mines where powder is used. It consists of one atom of carbon and one atom of oxygen, and since the carbon is not oxydized it is in itself combustible. One volume of this gas to seven of air will become a mass of flame when ignited; in the above proportions, however, its force is not great, but with the mixture in larger proportions its explosive force is largely increased.

That there is an unnecessary waste of powder in the mines of Rich Hill, as well as in some of the larger mines of Macon county, is apparent to anyone who will take the trouble to examine the statistical table of the Mine Inspector's annual report. Argument is not needed to prove the increased risk and dangers attending a reckless and extravagant use of powder in mining coal. No one will appreciate the force of this more than the experienced miner, and yet he persists in taking the risk. The importance of immediate action to secure an abatement of this evil practice cannot be too strongly urged.

The present mining laws of this State provide in a number of ways for the safety of men employed in the mines, and it is not stating the case too strongly (considering the cause of fatalities in our mines) to say that all are of comparative minor importance to the all important question of restricting the unlawful system which permits the blasting of coal off of the solid, and which is boldly and in face of its dangers defiantly permitted in a number of our largest mines.

I cannot believe that an explosion could have taken place in the mine at date of its occurrence or at any other date since I have had a personal knowledge of its condition provided. A proper amount of undermining and cutting had been done to free the coal; that the shot holes had been suitably placed and charged with the required amount of powder to bring down the coal, no matter how many shots may have been fired at any one time.

I am convinced that fully 80 per cent of the coal mine explosions are due to the inexperience and ignorance of a class of miners altogether to prevalent in our mines of late. Men whose qualifications for

this dangerous work appear to be of a satisfactory nature, when able to turn the handle of a boring machine in the work of drilling a hole, to charge the hole with powder and then tamp and fire the shot, ignorant alike of the expansive force of powder, the resistance of solid bodies and the simplest principles connected with coal mining. Lack of judgment in the location of a shot hole and with an over-charge of powder to bring down a few extra bushels of coal, and they have in preparation an infernal machine ready for the destruction of life and property. Such men are not miners, but are of the commonest class of unskilled tramp labor. How strange that operators are not more guarded where they have so much at stake, or can it be that it pays to take the risk and employ the low and grovelling who are willing to sacrifice manhood for a mess of pottage?

Why is it that the miners are unable as a body to protect their trade by such rules as obtain with the other trades whereby they can rid themselves of the unskilled? Is it because the unskilled are too numerous or that our miners are too easily brought under subjection by the power and influence exercised by operators or corporations? I can see no way out of the difficulty the miners labor under in this particular except through legislation. For many years the Legislatures of this State have promptly supplied the laws necessary to the protection called for by the miners and the State officers as a rule have been as prompt in the execution of these laws. I am confident that any reasonable request made in this direction will meet with the attention heretofore accorded the wishes of the great body of our miners.

In conclusion, would state that all matters coming under my observation during the investigation of this explosion tend to exonerate the Rich Hill Coal Co. and its officers from anything like censure for any failure whatever, either in the management of the mine or in the observance of the mining laws.

I am in full accord with the verdict rendered by the coroner's jury, and firmly believe that every shot that was fired on the day of the accident could have been fired one at a time, allowing sufficient interval between to permit the clearing away of the smoke and the restoration of the air circulation without inconvenience to the mine or miners.

As the rapidity of the firing was due to the action of the shot-firers, who were alone responsible under the circumstances for their safety, they have, to say the least, paid the penalty with their lives.

INSPECTION BY COUNTIES.

ADAIR COUNTY.

Production, 23,510 tons.

The coal measure formation underlies nearly all of Adair county, and is mined at numerous places within its limits; the principal mines, however, are located at Novinger and Stahl City.

There are two workable veins underlying nearly all the north and west part of this county; the upper vein crops out in the hills, and the mines are entered by drifts, while the lower vein is about 125 feet below the surface, and vertical shafts are sunk in order to reach the coal.

This large coal field will soon be developed and worked upon a large scale, and we expect to see Adair county ere long take prominence as one of the large coal producing counties of the State. Of the more important mines operated under the head of their respective postoffices, may be found a description of each.

KIRKSVILLE POSTOFFICE.

All the mines in the vicinity of Kirksville are located either on Hazel creek or on the banks of the Chariton river. Two mines are entered by drifts and one by a shaft 35 feet deep; hoisting by horsepower. These mines are working the same seam of coal, which is about 46 inches in thickness, and of good quality. The coal is taken away from the mines in wagons, and consumed at Kirksville and vicinity.

NOVINGER POSTOFFICE.

O. K. Coal Co.—Frank Stronpe, superintendent; mine located one mile west of Novinger and connected with the Q. O. & K. C. R. R. shaft 46 feet deep, equipped with steam power for hoisting. Ventilation is produced by a 10 foot ventilating fan, which sets in the up cast air-way at the shaft landing, exhausting through an air chamber partitioned off one end of hoisting shaft and has been furnishing a good

supply of fresh air in the mine. Coal 44 inches thick and worked on the room and pillar plan. The roof is a hard shale, and stands very well in rooms and entries. The mine is dry and in very good condition. There were 30 men at work and 53 cents per ton was paid for mining unscreened coal. The product is consumed at local towns along the line of the railroad.

STAHL CITY POSTOFFICE.

Pennsylvania Coal Co.—H. C. McCahan, manager; John Dawson, superintendent. This company is operating two mines at Stahl City, having shipping connection with the Q., O. & K. C. R. R. Both mines are drift openings and ventilation is produced by the aid of a furnace at each mine. Drift No. 1 is the most extensive mine of the two. I found the ventilation up to the requirements of the law on each inspection, and the mine in a very fair condition considering the trouble the company encountered in having to contend with faults and irregular coal. The coal varies in thickness from 36 to 46 inches, and is worked on the long-wall plan. Employment is given to 50 men and boys; pay for mining screened coal, 70 cents per ton.

Drift No. 2 enters a hill across a ravine and opposite No. 1; but very little coal was taken out of this mine during the past year, as it will soon be worked out. The coal at both drifts is of the same thickness and quality, and is sold in the same market. It is of good quality and demands a ready sale wherever it has been used. This company is now sinking a shaft to the lower vein at Stahl City near the railroad track, which will be ready for taking out coal this coming fall and winter.

The coal from these mines is consumed at local towns along the line of the railroad, but the railroad is using a large amount to coal its engines; chutes have been erected at Stahl City for that purpose.

AUDRAIN COUNTY.

Production, 37,611 tons.

Audrain county is situated on the eastern border of the coal belt of this State. The county is nearly all underlaid with the coal measure formation, and mining is carried on at various points in the county. The most extensive mines are located at Farber, Laddonia, Martinsburg and Vandalia, with small mines at other points. The same seam of coal is worked throughout the county with the exception of the mine at Mexico, which is a pocket of coal about $4\frac{1}{2}$ feet thick and of very good quality for all domestic purposes. Following is a description of each mine as found at date of inspection:

FARBER POSTOFFICE.

The escapement shaft connected with this mine caved in last summer, shutting off the ventilation, and the mine has remained idle ever since.

LADDONIA POSTOFFICE.

Laddonia Coal Co.; mine located at Laddonia; shaft 55 feet deep; horse-power; coal 26 inches thick and worked on the long-wall plan; pay for mining, 70 cents per ton for clean coal; coal taken away from the mine in wagons and consumed at Laddonia and vicinity; from 3 to 8 men employed.

Jos. Lynch; mine located southeast of Laddonia; shaft 35 feet deep; horse-power; coal 28 inches thick; mine operated in fall and winter to supply local trade.

MARTINSBURG POSTOFFICE.

Samuel McGuire.—Mine located south of Martinsburg; shaft 16 feet deep; horse-power. Coal 4 feet thick, and worked on the room and pillar plan. This mine is located on a pocket of coal extending over a large area. Mining here could be profitable engaged in were it not that it is four miles distant from the nearest railroad; having to haul the product in wagons such distance, makes the expense too great to successfully compete with other mines furnishing the same market. Much of the output, however, is shipped to local points along the line of the Wabash railroad. From 4 to 8 men employed.

C. P. Eastman operates a mine southeast of Laddonia to supply the home demand.

Weber Bros. operates a mine north of Laddonia. The coal is taken away from the mine in wagons and consumed in the surrounding country.

The McCowen mine is located in the same neighborhood and operating the same deposit of coal as mine above mentioned; mine only worked in fall and winter to supply home trade.

W. T. Taylor & Co.—Mine located $\frac{1}{2}$ mile east of Martinsburg, and connected with the Wabash railroad; shaft 107 feet deep; equipped with very fine machinery for hoisting; ventilation is produced by a furnace. I made two visits to this mine during the past year, but as it was not in operation at date of my first visit no inspection was made. I visited the mine again on the 17th day of January and made a careful inspection, found the ventilation in a very fair condition with all other requirements of the law complied with. Coal 30 inches thick,

and worked on the long-wall plan; pay for mining 86 cents per ton for screened coal. There were 18 men employed at date of last visit. The coal is consumed at local towns along the road.

MEXICO POSTOFFICE.

A very extensive deposit of coal was discovered one mile east of Mexico, about three years ago on the land of Mr. T. C. Davis. A shaft was sunk to the depth of 42 feet, when a seam of coal 4½ feet thick was struck; it proved to be of good quality, clear of sulphur or pyrites, and an excellent coal for domestic purposes. The roof is a soapstone, rather soft, but easily secured by timber. The coal is underlaid with fireclay mining, a proof according to the theory of geologists that it is a native of its present location; all indications go to show that it is a very extensive pocket of coal. The mine is only operated in a small way, having been very poorly managed; in fact I have not met a practical man in charge of the mine at any of my inspections and in the near future another shaft will have to be sunk and a new mine opened farther south in the same deposit; the present shaft will have to be abandoned on account of bad management. The coal is all consumed at Mexico and its vicinity. From four to six men employed.

Another mine has been operated northwest of Mexico during the past winter on the Waddington land; the coal from this mine was taken away in wagons and consumed at Mexico.

MOUNT CARMEL POSTOFFICE.

There are two or three parties operating mines in the surroundings of Mount Carmel in the fall and winter to supply the local trade. The same seam is worked here as that found in the other parts of this county, and after the same methods.

VANDALIA POSTOFFICE.

Vandalia Coal Co.—Thos. Morgan, superintendent; mine located one mile west of Vandalia, and connected with the Chicago & Alton railroad; shaft 75 feet deep, and equipped with very fair machinery for hoisting. Ventilation is produced by a 10-foot fan, which was giving satisfaction at dates of inspection. First inspection was made January 13th and mine found in good condition, with a strong, fresh current of air passing along the face of the workings. Second inspection was made June 23d, and I found that the requirements of the mining law were closely observed and obeyed. All the airways were found in good condition, and a sweeping current of fresh air passing along the face of all the workings. Coal 30 inches thick and worked on the

long-wall plan; it is overlaid with strong, black slate roof, well adapted for this method of mining. The mine is dry, roadbeds high, wide and clean, and in good condition.

The product of the mine is consumed by the railroad company, which is taken out of the chutes erected at the mine to coal engines. From 50 to 60 men and boys are employed, and mining is paid for at the rate of 86 cents per ton for screened coal.

Vandalia Brick Manufacturing and Mining Co.—This mine is located at Vandalia and is owned and operated by the Vandalia Coal Co. Shaft 65 feet deep, equipped with steam power for hoisting. Ventilation is furnished by a furnace and the mine is well ventilated. The coal is underlaid with good fire clay which is taken out at one part of the mine, leaving the coal for roof. The clay mine is worked on the room and pillar plan and requires considerable timber to keep it secured. Coal 28 inches thick, worked on the longwall plan with good slate for roof. All the coal produced is consumed at the mine in the manufacture of the clay into brick and other articles; steady employment is furnished to quite a number of men and boys around the mine and the brick works. Mr. Jacob Williams is superintendent of the mine and Mr. William R. Williams manager of the brick works.

There are several other local mines in this county, operating in the fall and winter to supply the home demand, which I had no time to visit. The mining law only requires inspection of mines employing five or more men. Yet since I assumed the duties of Mine Inspector of this State I have made every effort in my power to visit every mine in the State and to look carefully after the safety of every miner working therein.

BARTON COUNTY.

Production, 37,570 tons.

Coal is mined in nearly every township in this county, but on a limited scale only. The county is largely underlaid with the coal measure formation, but owing to the shallowness of the covering, underground mining is impractical, and a very large proportion of the coal mined in this county is obtained by stripping. All the mines in the vicinity of Minden have been worked out and abandoned, and the only commercial mine now operated in the county is located at Herman station; it has shipping connection with the K. C., Ft. S. & M. R. R. I made two inspections of the mines of this county during the past year. Following is a full description of the principal mines relative to their sanitary and other conditions as found at dates of inspection:

LAMAR POSTOFFICE.

A large amount of coal was mined during last fall and winter in the surroundings of Boston and Lamar to supply the local trade. The coal is only about 15 inches in thickness and is worked on the room and pillar system. It is taken away from the mines in wagons and consumed at Lamar and its vicinity. The name of the respective operators and output of every mine, with other information, will be found in the statistical table of this county with this report.

LIBERAL POSTOFFICE.

Joseph Travis operated a slope mine near Liberal. Coal 2 feet thick and worked on the room and pillar plan; 2 men employed.

John H. Lanery operates a mine on the Boulware Bros. land. Coal 26 inches thick and worked on the room and pillar plan; mine operated in fall and winter to supply local trade.

Betz & Breinogle operate the mine formerly operated by Betz; drift opening. Coal 28 inches thick and worked on the room and pillar plan; part of the output is shipped over the K. C., Ft. S. & M. R. R. and consumed at local towns along the line; from 3 to 4 men employed during the winter months.

Allen & Colly operate a mine near Liberal; drift opening. Coal 28 inches in thickness and worked on the room and pillar plan. This mine is the largest producer of any of the mines in the surroundings of Liberal; ventilation is produced here by nature, as it is with all other mines in this neighborhood. The coal is shipped to and consumed at towns along the line of the K. C., Ft. S. & M. R. R.; about 8 men employed in winter.

H. J. Whitesell operates a strip pit near Liberal; the coal is hauled from the mine in wagons and shipped to market over the K. C., Ft. S. & M. R. R.

John Prosser operates a drift mine near Liberal to supply local trade.

Cox & Thomas, Kiser & Mathews and John Durham, John Foote, Chas. Convron and others operated mines in the surroundings of Liberal during last fall and winter. All were operating the same seam of coal; it crops out on the side of the hills and all of the mines are entered by drift. The coal varies in thickness from 22 to 28 inches. It is of good quality and easily mined; the roof is a soapstone and easily made secure.

MINDEN POSTOFFICE.

Minerd Bros. Coal Co.—Mine located 1½ miles west of Minden, near the State line. It was formerly known as the Morgan mine. It has a shipping connection with the K. C., Ft. S. & M. R. R.; shaft 40 feet deep, and its hoisting is done by steam-power. I inspected this mine on the 29th of October, and found the ventilation deficient, the mine in very poor condition, with very little prospect of bettering it, as it was nearly worked out. On the first of January Mr. Minerd notified this office that the mine had been abandoned.

The Sunshine mine, located west of Minden, is also worked out and abandoned.

VERNON POSTOFFICE.

Wear Coal Co.—A. B. Kirkwood, superintendent, and Wm. McKinley, foreman. Mine located at Vernon station, 2 miles north of Minden and connected with the K. C., Ft. S. & M. R. R. Shaft 45 feet deep, equipped with good machinery for hoisting. Ventilation is furnished by a 10-foot fan. The mine is well ventilated, the air is split at the bottom of the down-east into two currents; one current is made to travel to the face of the east entry, where it splits again to the north and south cross-entries and returning to the fan over an air-crossing. The other current travels over the west entry to its terminus, and is there divided to the north and south cross-entries, making in all four separate currents, and giving to this mine the reputation of being not only one of the best ventilated, but as one of the most practically operated mines in the State. In fact, this is the only mine in the State operated on the treble-entry system. Coal 34 inches thick, worked on the room and pillar plan; 60 cents per ton is paid for mining in winter, and 50 cents in summer for unscreened coal. Shot-firers are employed by the company to fire all shots after the miners and other employes have retired from the mine. From 75 to 100 men and boys employed.

BATES COUNTY.

Production, 375,300 tons.

Bates county shows an increase in her output over the preceding year of 123,069 tons of coal. During the past year 375,300 tons were mined which was sold at the mines for \$337,838, or an average of 98 cents per ton. To produce the amount of coal 579 miners were employed during the winter months and 439 during the summer. The number of mines operated during the past year was 28, of which 5 are

shafts, 9 are slopes, 2 are drifts, and 12 are strip-pits. At 5 of the mines steam-power is used, and at 10 horse-power is employed, while hand-power is used at 1.

There are 5 fans, and 5 furnaces used for ventilations, 6 of the smaller mines have no ventilating appliances. The most productive mines are located in the vicinity of Rich Hill, although mining is prosecuted in nearly every township in the county.

The most of the coal is taken to market over the Missouri Pacific railway, which passes through the center of the coal field. Three inspections were made of all the mines of Bates county during the past year. Following is a description of the same, and a statement as to their condition as found at dates of inspection:

AMORET POSTOFFICE.

Black Diamond Mine, operated by C. W. Feild; mine located between Amoret and Worland. Mine entered by a slope, and horse-power is used in taking out the product. Coal is 40 inches thick and worked on the room and pillar plan. The coal is taken away from the mine in wagons, and loaded on cars at a switch formerly used by the Blue Lick Coal Company, and then shipped over the P., K. C. & Ft. Smith R. R., and consumed at local towns along the line. From 3 to 9 men employed, and 65 cents per ton paid for mining.

M. Roland, J. J. Riddle and J. M. Gauf operate strip mines near Amoret, they have shipping connections with the same railroad as the Diamond mine, and the product of the mines is consumed in the same market. The coal in the vicinity of Amoret will average over 3 feet in thickness, and is of good quality, but owing to the shallowness of the covering, underground mining cannot be prosecuted here, and the most of the coal is obtained by first removing the overlying surface, which is called stripping, and then taking out the coal.

AMSTERDAM POSTOFFICE.

Flamsburg & Son operates a mine near Amsterdam; mine operated in the fall and winter to supply local trade.

Thos. Compton operates a mine near Amsterdam to supply local demand.

There are other parties at this place and at Mulberry operating mines during the winter season to supply the home trade. The coal here is of the same thickness and quality as that worked in the vicinity of Amoret.

FOSTER POSTOFFICE.

The coal seam which is mined in the surroundings of Foster is the same as that worked at Amoret, Amsterdam and Worland and throughout Eastern Kansas. It is about 3 feet in thickness, and is of very good quality.

The shallowness of the covering over the coal makes underground mining impractical, and the mode of mining prosecuted here is done by first removing the overlying surface, and then taking up the coal. It is then hauled in wagons to the railroad switches, loaded on cars and shipped over the Missouri Pacific railroad to Kansas City and points west. There were from 20 to 25 strip-pits, slopes and drifts in operation during last fall and winter in the surroundings of Foster, and the name of operator and output of every mine, with other information, will be found in the statistical table of this county.

Kansas State Line Coal Co.—Mine located 1½ mile west of Foster; slope opening; coal is taken out by horse-power; ventilation is produced by a furnace which was giving very fair results. Coal 3 feet thick and worked on the long-wall plan; it is underlaid by fire clay mining and overlaid with soapstone roof, which is soft and friable and not a very desirable roof for this method of mining, as every new break in the roof cuts with the solid and fills up the face of the rooms with dirt. Another disadvantage to the long-wall system of mining in a soft and friable roof is that in the event of a slackness in the demand for coal, and the mine is compelled to lay idle it works injury to the mine, for wherever the long-wall method is practiced with a poor roof to contend with, the mine must be worked every day to make it a success. The mine is located about 500 yards from the railroad, but a tram-road has been built from the mine to the track and the coal is now loaded on the cars at Rucker switch and shipped to market over the Missouri Pacific railroad. The coal is of very good quality and finds a market when once tried. It is known as the celebrated Darby Hill coal.

Geo. Young operates a mine near the above named mine on the north side. Shaft 40 feet deep; horse-power used for hoisting. Coal 3 feet thick and worked on the room and pillar plan. The output of this mine is taken away in wagons and loaded on cars at Rucker switch and shipped over the Mo. P. R. R.

There are several other parties operating small mines in the neighborhood of the last named which we had no time to visit. The above are all drift mines entered and driven from the bottom of strip-pits,

after the covering has become too thick to profitably take the coal out by stripping.

HUME POSTOFFICE.

Thos. Manchester & Son.—Mine located at Hume; shaft 70 feet deep; horse-power used for hoisting. Coal 30 inches thick and worked on the room and pillar plan; ventilation is produced by a furnace; 65 cents per ton paid for mining; about 5 men employed.

RICH HILL POSTOFFICE.

Rich Hill is surrounded by large and extensive mines for a radius of 5 miles, and the coal belt that runs through Bates county is almost inexhaustible. While several large mines have been worked out and abandoned, yet new mines have been opened out in close proximity to the abandoned ones, and are great producers. The thickness of the coal in the vicinity of Rich Hill varies from 3 to 6 feet, and the prices paid for mining is 45 cents per ton for all coal 3 feet 9 inches and over in thickness as a winter price, and 40 cents for same thickness in summer, and 50 cents per ton for all coal under 3 feet 9 inches as a winter price and 45 cents for same in summer; these prices are for unscreened coal. The mines are all worked on the double-entry room and pillar plan, and the coal is mined by blasting it off of the solid.

Three inspections have been made of all the mines in the Rich Hill district during the fiscal year, and the location and condition of each mine will be found as follows:

Barron Bros. operate a drift mine about a mile north of Rich Hill. The mine is opened from the bottom of a strip-pit. Coal is taken away in wagons and consumed in the vicinity. Mine only operated in fall and winter to supply local trade.

Bruce & Rees Coal Co.—Mine located 4 miles north of Rich Hill, and has shipping connections with the K. C., Ft. S. & M. R. R.; shaft 120 feet deep, and equipped with first-class machinery for hoisting.

Practically this may be considered a new mine, the shaft was sunk last year and the equipment of the mine is new, strong and substantial. A pair of engines are in use which were built by the Riverside Iron Works of Kansas City, with cylinders 12x22 inches in diameter, connected direct to a 4-foot drum. Cages, ropes and all the safety appliances are new and of modern improved pattern; the pit-head, tipple and weigh-house are all very substantially constructed and conveniently arranged to load the various kinds of coal. Ventilation is produced by a 12-foot fan, and the mine is well ventilated. I made the first inspection of this mine on the 26th of October and found

that the new shaft had been sunk, and a connection made with the slope formerly operated. There were 30 men at work on this visit and the mine well supplied with good air. I made another inspection on the 21st of February and found the mine in good condition. May the 14th I visited the mine again, and found that a connection had been made with old Nos. 5 and 6 Gulf, both of which were abandoned mines, and considerable trouble encountered by foul air passing from the old works, and mixing with the fresh air, thus vitiating it and rendering it unfit to breathe. Every effort was made by the management to build stoppers and shut it out, but as the entries were being driven between the two old mines named, a break through would occasionally occur and admit the passage of a new supply of foul air. This will be obviated, however, as the work advances rapidly and it will soon be driven beyond the old workings and the mine will be fresher and healthier for the employes. Coal 4 feet thick and worked on the room and pillar plan; 60 men employed at date of last inspection; a large amount of coal is consumed by the railroad company.

Martin & Gee.—Mine located northeast of Rich Hill, on the Spencer land; has a shipping connection with the Missouri Pacific railroad. Coal is brought out through a drift and mine ventilated by a furnace. I made three inspections of this mine during the past year and found it well ventilated and in good condition at each visit. Coal about 4 feet thick and worked on the pillar and room plan; 50 cents per ton is paid for mining forked coal; from 12 to 25 men employed. Coal consumed at Kansas City and points west.

J. O. Griggs operates a strip-pit near Rich Hill to supply local trade.

Peter Pearson operates a strip-pit near Rich Hill in the fall and winter to supply local trade.

McMahon & Page operate a strip mine northwest of Rich Hill in the fall and winter months. The coal is the same as that of other mines in the vicinity and is consumed in the surrounding country.

Contract mine.—Operated by Daniel Rees; located 4 miles north of Rich Hill; slope opening, and the product is brought out by steam-power; ventilation is furnished by a 10-foot fan, which was giving very good results at each inspection. Coal 4 feet thick and worked on the room and pillar plan. From 30 to 40 men employed.

Rich Hill Coal & Mining Co.—Major R. M. McDowell, general manager; W. B. Williams, general superintendent. This is the largest coal company in the State, the output of its mines constitutes a very large portion of the coal production of the State for the past year. All of its mines are operated on the double entry room and pillar plan, and

the coal mined by blasting it off the solid. The mines are all well ventilated, and the requirements of the mining law closely observed by the management. All the doors are made of double lumber and are properly hung, the airways are high, wide and roomy, and a large volume of air can travel through them at a low rate of speed. In fact, the mines are practically operated and well managed. Three inspections were made of each mine during the past year and their condition found as follows:

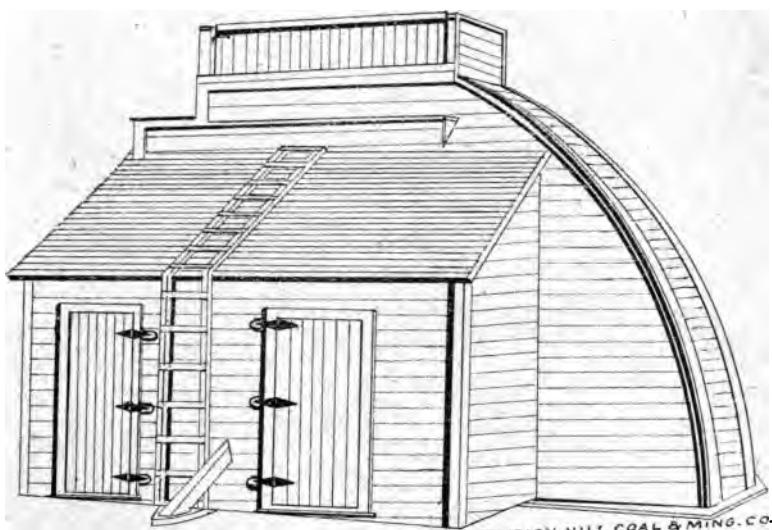
Mine No. 15.—Alex. McKinnon, foreman; mine located 1½ miles south of Rich Hill, and connected with the Mo. P. railroad by a switch; shaft 106 feet deep, and equipped with first-class machinery for hoisting and ventilating. This is the largest coal producer, as well as the best equipped, and the most practically operated mine in the State, with few equals in any other mining state in the country. The ventilation is produced by a 15-foot fan, which is set on the top of the escapement shaft, exhausting the air from the mine. I made the first inspection of the mine on the 25th day of October, the fan on this date was running at a speed of 82 revolutions per minute, and 53,875 cubic feet of air was found circulating through the mine in same length of time. This volume was passing around the mine in 5 separate currents, giving an abundance of fresh air to every part of the mine and returning to the up-cast by different routes over air-crossings.

Having made a careful examination of the mine at this date, I pronounced it safe and in good condition. On the 11th of December an explosion occurred here which resulted in the death of two men, 14 mules and done great damage to the mine. (The full particulars of this accident, with other information concerning same, will be found in an article on explosion embodied in this report). Having made two visits of investigation as to cause or causes which led to the disaster, which I have fully described in article on explosion, I visited the mine again on the 19th of February and made another careful inspection; I found the damage done by the explosion fully repaired and the mine in better condition than ever before, with a larger volume of air passing. The fan at this date was running at a speed of 68 revolutions per minute, and 65,330 cubic feet of air was found passing around the mine in same length of time. Four thousand feet of the airways had been cleaned, timbered and enlarged, which caused this large increase in the air volume. I inspected the mine again on the 13th of May and found it in good condition with the requirements of the mining laws fully observed. I traveled through all the airways on this inspection and made a careful examination of all the abandoned workings and found them clear of gas and a good current of air trav-

eling. There were an average of 200 men and 20 mules employed all through the year. When the mine is run to its full capacity its output amounts to about 1500 tons per day. The coal varies in thickness from 3 to 5 feet; the mine is practically dry with good high wide roadways and in excellent condition. All the main entries have double roads; loss of time is thus avoided and one driver is not compelled to wait on another one to get out of his way. The coal is shipped over the Mo. P. R. R. to Kansas City and points northwest.

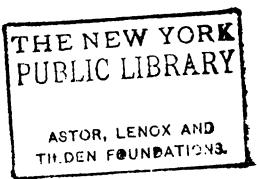
Mine No. 18.—Thomas Davidson, foreman. Mine located 1 mile south of Rich Hill, and connected with the Missouri Pacific railroad by a switch. This is a slope opening, driven from the bottom of a strip-pit, and the product is brought to the surface by steam-power. The coal is irregular and faulty; it varies in thickness from 3 to 4 feet. The mine is ventilated by a 10-foot fan, which was giving good results; in fact, this is one of the best ventilated mines in the State. The roof is soft and friable, requiring great care and a large amount of timber to keep it secured.

Mine No. 19.—James Price, foreman. Mine located 5 miles north of Rich Hill, and has shipping connection with the Missouri Pacific railroad. Shaft 105 feet deep, and equipped with good machinery for hoisting. A 12-foot ventilating fan furnishes the ventilation; it is the best ventilating fan in the State, and is surpassed by very few in any other state. The volume of the ventilative current in this mine was found to be more than double the amount required by law; in every other respect the mine was found in good condition. An explosion occurred here on the 17th of October, resulting in the death of 2 men and 3 mules and much damage to the mine. All the particulars concerning the accident will be found in an article written on the explosion, which is embodied in this report. I made the first inspection of the mine after the explosion on October 26. The ventilation was furnished at this date by an 8-foot fan, which was set on top the hoisting shaft, and exhausting the air from the mine through an air chamber partitioned off one end of main shaft; it was running at a speed of 138 revolutions per minute, and passing 25,800 cubic feet of air in same time. This volume was conducted around the mine in two currents, and passing a good supply of air around every part of the mine. February 20 I inspected this mine again and found it in good condition. I also found that a new fan had been erected to ventilate the mine in place of the 8-foot fan formerly used. The new fan is set on top of the escapement shaft, and is well constructed; it was making 55 revolutions per minute at this date, and forcing 43,200 cubic feet of air



FAN HOUSE ERECTED BY W.B.WILLIAMS SUPT. RICH HILL COAL & MINING CO.

2415



around the workings in same time. I inspected the mine again on the 14th of May, and found it in excellent condition, with the ventilation above the requirement of the law, and all the safety appliances in good repair. Coal about 4 feet thick and worked on room and pillar plan. From 75 to 100 men and boys are employed. The product is taken to market over the Missouri Pacific railroad, and consumed at points west.

Wm. Sullivan operates a mine near Rich Hill ; slope opening ; coal 4 feet thick and worked on the room and pillar plan ; mine has shipping connection with Missouri Pacific railroad ; from 5 to 15 men employed. There are several other parties taking out coal in the surroundings of Rich Hill ; their names, output of each mine and other information in relation to the above will be found in the statistical table of this county.

ROCKVILLE POSTOFFICE.

A large vein of coal is worked about six miles northwest of Rockville, which runs in thickness from 5 to 6 feet, but owing to the shallowness of the covering over the coal, underground mining is impractical. The coal is obtained by first removing the overlying surface dirt and slate.

Other veins are supposed to exist in this locality, and considerable prospecting has been done here of late years by different parties ; I have no doubt that extensive mines would be opened here if better railroad connections could be secured.

John A. Ford operates a mine 6 miles north of Rockville. The coal will average 6 feet in thickness and is consumed in the surrounding country.

D. D. Peeler operates a strip mine in the same locality ; the coal is about the same thickness as the other mine and is consumed in the surrounding neighborhood.

These mines are located 6 miles away from a railroad, and the output is confined to the local trade.

WORLAND POSTOFFICE.

There is a very large amount of coal mined in the vicinity of Worland, but most of it at strip-pits. The covering over the coal in this locality is so shallow as to make underground mining impracticable as well as unprofitable. Coal will average about 3 feet in thickness, and is of very fine quality. It is underlaid with fire-clay mining and overlaid with soapstone roof.

Albert Eynon operates a mine at Worland; slope opening; entered from the bottom of a strip-pit; coal shipped over Missouri Pacific railroad.

Rankin Bros. operates a mine in the same locality and on same seam. Coal taken away in wagons and shipped over Missouri Pacific railroad.

Raney & Hetherly operate a mine at Worland; slope opening; taken away from the mine in wagons and shipped to market over Missouri Pacific railroad.

J. M. Tatley is operating a mine near Worland; slope opening driven from the bottom of a strip-pit. Same seam of coal is worked at all of these mines and the same method of mining used, which is the room and pillar plan. Coal taken away from the mine in wagons and shipped over Missouri Pacific railroad.

Henry Washburn, successor to Raney & Washburn.—Mine located one mile east of Worland; shaft 45 feet deep; horse-power used for hoisting; coal 3 feet thick and worked on the room and pillar plan; small furnace is used to furnish the ventilation. The coal is taken away from the mine in wagons and loaded on cars at Ward's switch and shipped to market over the Missouri Pacific railroad. Employment is given to 8 or 10 men in the fall and winter, and 60 cents per ton is paid for mining clean coal.

Banks & Stringer, John Bright, John Jerodo, C. G. Dening and others operate strip-pits in this vicinity and ship the product of their mines over the Missouri Pacific railroad. Name and output of each mine, with other information, will be found in the statistical tables of this county.

BOONE COUNTY.

Production, 20,428 tons.

Coal is mined in nearly every township in Boone county, but on a limited scale, the Columbia Mining Company only having railroad shipping facilities. All the other mines throughout the county are operated simply to supply home consumption.

COLUMBIA POSTOFFICE.

Blackfoot Coal Co.—Thos. Morgan, superintendent; mine located five miles northwest of Columbia, on the gravel road; shaft 120 feet deep with horse-power hoisting apparatus. Ventilation is furnished by a furnace which was giving good results. I made two inspections of the mine during the past year and found it in very good condition at each inspection. An escapement shaft had been sunk and a

nexion was being made between the two shafts in order to furnish an avenue of escape to the men in case of accident, as well as making the ventilation considerably better. Coal 44 inches in thickness and worked on the room and pillar plan. It is underlaid by fire clay mining and overlaid with good shale roof easily secured with timber. The same seam of coal is worked here as that so extensively mined in Macon and Randolph counties. It is hauled in wagons from the mine and consumed at Columbia. This could be made a very extensive mine if it had shipping facilities, and while it has a very good output as a local mine, it could be largely increased should the demand require it. Capacity at present is limited to the local trade. From 10 to 20 men are employed during the fall and winter, and 75 cents per ton is paid for mining screened coal.

J. W. Carter.—Mine located 3 miles north of Columbia; shaft 40 feet deep, horse-power. The same seam of coal and same method of mining is employed here as at the Blackfoot Co. mines, and the coal consumed in same market. The mine was closed and abandoned last spring, and Mr. Carter is now opening a new mine in the same locality and will be ready for operation early in the fall.

Columbia Coal Co.—Mine located at Henry station, and connected with the Columbia branch of the Wabash railroad. Shaft 112 feet deep and operated by steam-power for hoisting. Ventilation is furnished by a fire-basket located at the foot of the air-shaft, and was giving fair satisfaction. The coal is about $3\frac{1}{2}$ feet in thickness and worked on the long-wall plan; it is underlaid with fire-clay mining, and overlaid with a soapstone roof very soft and friable requiring very careful timbering. From 15 to 20 men employed, and 70 cents per ton paid for mining. Most of the output is consumed by the railroad company.

Scott & Gordon.—Mine located near Columbia; drift opening and ventilated by a small furnace; coal about $2\frac{1}{2}$ feet thick and worked on the long-wall plan. From 8 to 12 men employed, and 85 cents per ton paid for mining. The product is consumed in the immediate neighborhood, a large amount being sold to supply the water-works at Columbia.

Oakland Coal Company is a combination of small operators, who for a year have been mining in both drift mines and strip-pits in the surroundings of Columbia, hauling the product of their mines in wagons to Columbia, at which point it is consumed. Following are the names of several parties who operate small mines in the fall and winter months to supply the home demand.

Lone and Frank Megee, J. L. Harris, Crosswhite & Lowery, Lawrence Quitter, John F. Gosset, John L. Ballenger, T. T. Sublett, N. B.

Zering and others. All these parties are operating the same vein coal, and upon the same method of mining, namely, room and pillar.

BROWN STATION POSTOFFICE.

Isaac Davies is operating a drift mine near Brown station to supply local trade.

Geo. Rodgers.—Mine located near Brown station; shaft 18 feet deep; horse-power; coal $3\frac{1}{2}$ feet thick. It is taken away from the mine in wagons and consumed in the surrounding country.

HARRISBURG POSTOFFICE.

W. A. Stidman operates a mine near Harrisburg; shaft 20 feet deep; horse-power. Coal 4 feet thick, and worked on the room and pillar plan. The mine is operated during the winter months, and the product consumed in the surrounding country.

PERCHE POSTOFFICE.

J. W. Stone is operating a mine in the vicinity of Perche to supply the local trade.

RUCKER POSTOFFICE.

Geo. Bryant is operating a mine near Rucker, on the Buckler land. Coal $3\frac{1}{2}$ feet thick, and worked on the room and pillar plan; operated during winter months to supply home demand.

John Belcher is operating a mine on the land of Mr. White. Coal taken away in wagons, and consumed in the vicinity of Rucker and surrounding country.

The Given mine was operated last winter by Mr. Buckler, and the product consumed in the home market.

CALDWELL COUNTY.

Production, 19,780 tons.

HAMILTON POSTOFFICE.

Caldwell Coal Co.—E. B. Hayden, president and manager. Mine located two miles east of Hamilton and connected with the Hannibal & St. Joe railroad. Shaft 507 feet deep; equipped with first-class machinery for hoisting, draining and ventilating. Three inspections were made of this mine during last year—September 12, March 16 and June 13—and at each visit found the mines in very fair condition, with the ventilation up to the requirements of the law. The safety appliances—brakes, safety catches, cages and hoisting ropes—were all in good repair. Two new hoisting ropes were put in use last year.

replace old ones about worn out. Ventilation is furnished by a 10-foot fan, which was giving good results at each date of inspection. I found the permanent air-course from the bottom of the fan shaft to the face of the workings on the west face greatly improved and a larger volume of air passing. The coal is underlaid by fireclay mining and the roof overlaying it a mixture of shale and soapstone formation, troublesome and expensive to keep up. The coal is about 18 inches thick, worked in the long-wall plan, of excellent quality and unsurpassed for steam purposes.

KINGSTON POSTOFFICE.

Kingston Coal Co.—Mine located one mile north of Kingston. Shaft 247 feet deep and operated with good machinery for hoisting. In the 9th annual report of this Department it will be seen that this mine was forced to close down, having failed to sink an escapement shaft in accordance with the requirements of the mining law. Some time in January new proprietors took charge of the mine, and on my visit to same, on the 13th of February, preparations were being made to sink the shaft to the lower vein, 150 feet below. Some time in March this office was notified that the company was operating and working the upper veins in direct violation of law, as well as in opposition to my instructions. I visited the mine at once and found that the information received was correct. Suit was brought in the circuit court at once to force a compliance with the law. Between the time of filing my information and the convening of the circuit court the mine was again sold and a new owner took possession and charge of same. Promise was made me by the new owner that an escapement shaft would be sunk before any attempt was made to work the mine; for this reason the suit was withdrawn. The mine has not been worked since my visit of February 13th, and the shaft is full of water.

CALLAWAY COUNTY.

Production, 22,182 tons.

The principal mines in Callaway county are located in the vicinity of Fulton and are operated to supply the local demand. The only mine in the county having shipping facilities is operated by the Fulton Fire Brick & Manufacturing Co. Nine mines were operated during the year, but most of them are small and worked only through the winter months. The mines produced 22,182 tons of coal, which was sold at the mines for \$30,550, or an average of \$1.38 per ton.

FULTON POSTOFFICE.

Wm. Castle is operating a mine southeast of Fulton; drift opening, and worked on the long-wall plan. Coal about 26 inches thick, and \$1.10 per ton paid for mining. Product is consumed at Fulton and its vicinity.

Massey & Renolds operate a mine south of Fulton on Ed. Curd's land. Coal 2 feet thick and worked on the long-wall plan. Operated only in the fall and winter; the product is consumed at Fulton.

Chris. Lammers is operating a mine on the Curd land to supply local trade.

Robert Thorpe is operating a mine near Fulton, and hauling the coal to Fulton where it is consumed.

John Harris.—Mine located one mile south of Fulton; shaft 45 feet deep; horse-power; ventilation is furnished by a small furnace; coal about 33 inches thick and worked on the long-wall plan; one dollar per ton is paid for mining screened coal. Employment is given 6 to 8 men in fall and winter, and coal hauled in wagons to Fulton where it is consumed.

James Smith operates two mines south of Fulton; both are drift openings; ventilation is furnished by the aid of a furnace at each mine; coal 2½ feet thick and worked on the long-wall plan. These are the most productive mines in this locality; the product is consumed at Fulton, supplying the State institutions. From 10 to 15 men are employed in the fall and winter, and one dollar per ton is paid for mining.

Carbon Valley mine.—Operated by J. W. Simmons; drift opening and worked on the long-wall plan; employing 4 to 5 men, and paying a dollar per ton for mining.

Samuel Maycock is operating a mine near Fulton; coal 3 feet thick and worked on the long-wall plan; ventilation furnished by a furnace; employment is given to 5 men, and the product consumed at Fulton.

John Marsenkoff is operating a mine near Fulton; shaft 50 feet deep, and worked on the long-wall plan; only operated in winter to supply local trade.

Fulton Fire Brick & Mining Co.—L. V. Nichols, superintendent, and H. Harris, foreman. Mine located 2 miles south of Fulton, and connected with the Jefferson City branch of the Chicago & Alton R. R.; shaft 100 feet deep, and operated by steam-power for hoisting; ventilation is furnished by a fan, and the mine is well ventilated. The roof on the entries has been taken down, and mules are now used to haul the coal to the shaft bottom in place of men; new work has been opened up and some of the old work abandoned; considerable im-

provement has been made in the mine during the past year. The mine is dry and in very fair condition. The roof is a soft soaptone, requiring a large amount of timber to make it safe. Thirty feet below the coal a fireclay seam is worked; both the coal and the clay are hoisted out through the same shaft. The clay seam is about 8 feet thick and worked on the room and pillar plan, for which 26 cents per ton is paid for mining, and 75 cents per ton for mining the coal. Most of the coal is used by the company in the manufacture of the clay into brick and other articles, thus giving employment to from 50 to 60 men in and around the mine.

HAMS PRAIRIE POSTOFFICE.

A pocket of the cannel variety of coal with a thickness of 8 feet was discovered a short time since by Mr. J. A. Littel. The deposit is overlaid with a good roof and in addition there is every evidence that it covers an extensive area. Mr. Littel has opened it up and is now mining in a small way to accommodate the local trade.

MCREEDEE POSTOFFICE.

James Henderson has a mine on his land, which is operated by Ed Allen; mine operated in fall and winter; the product is consumed in the surrounding country.

CARROLL COUNTY.

Production, 2304 tons.

Very little mining has thus far been carried on in Carroll county, notwithstanding the entire county is underlaid with the coal measure formation.

There are several parties operating mines at Little Compton and in the vicinity of Carrollton, but only in a small way to supply the home market. The coal varies in thickness from 16 to 22 inches, and is the same seam as that so extensively mined in Ray county. The following parties are operating mines in the above named places:

CARROLLTON POSTOFFICE.

Henry Brooks.—Mine located near Carrollton; slope opening; coal 18 inches thick and worked on the long-wall plan to supply local trade.

Scott Wilson is operating a mine near Carrollton; shaft 26 feet deep; horse-power. Coal consumed at Carrollton.

Leander Christman is operating a mine at Carrollton to supply the home demand.

Harry Willcoxen operates a mine near Carrollton. Coal 16 inches thick; product consumed in the vicinity.

Mat Bolen is operating a mine near Wakenda. Coal same thickness as at other mines in the neighborhood, and is consumed in the immediate surroundings.

LITTLE COMPTON POSTOFFICE.

Ralph Farr operates a strip-pit near Little Compton. Coal consumed in the surrounding country.

M. F. Ogle is operating a drift mine to supply home trade.

Walter Reynolds operates a drift mine in the vicinity of Little Compton to supply local trade.

Jas. Whitehead.—Mine located near Little Compton; operated several months in the year to meet the home demand.

Wm. Hughes.—Drift opening; coal 24 inches thick; product consumed in the vicinity.

HALE POSTOFFICE.

Black Crow Coal Co.—Mine located near Hale; shaft 57 feet deep; operated by horse-power and ventilated by a furnace. Coal 2 feet thick and worked on the long-wall plan; the product consumed at Hale and vicinity.

CEDAR COUNTY.

Production 1863 tons.

Very little mining is done in Cedar county. The coal is found in local deposits in the hills and the mines are entered by drifts and slopes. The coal runs about 24 inches in thickness and is worked on the room and pillar plan, and \$1 per ton is paid for mining. The coal is taken away from the mines in wagons and consumed in the surrounding neighborhood.

Following are the names of parties operating mines during the past year:

EL DORADO SPRINGS POSTOFFICE.

R. H. Estes operates a mine near El Dorado. Coal 20 inches thick. Mine operated to supply local trade.

C. M. Schrader is operating a strip mine in same locality. Coal consumed at El Dorado Springs.

There are several other parties operating mines on a small scale in the surroundings of El Dorado and hauling the coal to the Springs, where it is consumed.

JERICO POSTOFFICE.

These mines are all located in the vicinity of Jerico, and are operated to supply the home consumption. Following are names of parties operating them: James Conner, John Scofield, John Moore, William Greenfield, George Poage, J. C. Duncan, J. McLeod, Daniel Riel, Chas. Jones, Henry Hendrick, B. Heffner and the Packard mine. The output of these mines, with other information, will be found in the statistical table of this county.

CHARITON COUNTY.

Production, 355 tons.

Chariton county is underlaid with the coal measure formation, yet very little mining is carried on.

The mines that have been operated during the past year are worked upon a small scale to supply home consumption.

The same seam of coal runs under a portion of this county, as that which is so extensively mined in Randolph and the adjoining counties and can be found at a depth of about 150 feet. In 1894 a shaft was sunk at Salisbury, which struck a 5 foot seam of coal at a depth of 175 feet, but unfortunately for operator and miner, the coal proved to run irregular and faulty; the roof also was soft and full of slips, hard to keep secured with timber, and after spending a large amount of money in developing the mine it had to be abandoned. A few local mines are operated in the neighborhood of Dalton, Indian Grove, Guthridge, Brunswick, New Comer and Salisbury. The coal from every one of these mines is hauled away in wagons and consumed in the respective neighborhoods. The names of all operators and the output of each mine and other information will be found in the statistical table of Chariton county.

CLAY COUNTY.

Production, 6500 tons.

Missouri City Coal Co.—Mine located at Missouri City and connected with the Wabash railroad. Shaft 165 feet deep and equipped with first-class machinery for hoisting and draining. I made the first inspection of this mine on the 16th of November and found it in very good condition. The ventilation at this date was furnished by a steam jet which was giving very fair results, as the mine is new. An escape-mine shaft was in course of construction at the time and was down 106

feet, and the work was being pushed night and day. On the 3d of February we were advised by the management that the escapement shaft was completed, a fan built, and that everything had been done in conformity with the mining law. I visited the mine again on the 2d of May and found it temporarily closed, hence no inspection was made. Coal 22 inches thick and worked on the long-wall plan, with fire clay under-mining and an excellent rock roof. The mine has been practically opened up and is considered a very good one. The equipment is entirely new and in good condition. There were 40 men at work at date of inspection. The product is consumed at Kansas City.

COOPER COUNTY.

Production, 750 tons.

BOONVILLE POSTOFFICE.

There is considerable coal in Cooper county and mining has been carried on for a great number of years. The coal lies in pockets and is mostly of the cannel variety; it is found all over the county; there is also a thin seam of bituminous coal in the vicinity of Boonville.

Chas. Hazell, H. W. Jenkins and the Hazell Coal Co., operate mines near Boonville, to supply the home demand; coal 16 inches thick and worked on the long-wall plan, and the product taken away in wagons, and consumed at Boonville.

Missouri Valley Coal Co.—Mine located 4 miles west of Boonville, and connected with the Boonville branch of the Mo. P. R. R.; shaft 40 feet deep; steam-power. Coal 7 feet thick, and worked on the room and pillar plan. The company is sinking a new shaft, the old one caved in and was abandoned.

DADE COUNTY.

Production, 4570 tons.

Coal mines have been opened and worked in Dade county for more than 30 years, but only in a small way to supply local trade. The coal is found in pockets in the hill tops and runs very irregular. It will average about 30 inches in thickness and is of very good quality; it is underlaid with fire-clay mining, with an excellent roof over it, and worked on the room and pillar plan. The mines are entered by shaft; one dollar per ton is paid for mining.

The mines are located 12 miles from the railroad, and the coal is hauled to and consumed at Greenfield, Golden City, Lockwood and the surrounding country.

Following is a list of names of the parties who operates mines in *this county.*

SYLVANIA POSTOFFICE.

W. E. Sutton, Thos. Gardner, Thos. Allen, Watterberry & Harrick, and J. Myers, John Heel, J. F. Farmer, Finorey, Winders & Taylor, Robt. McChuey, Milford, Johnson and J. R. Seaton.

The output of these mines, with all other information concerning same, will be found in the statistical table of Dade county in this report.

GRUNDY COUNTY.

Production, 41,000 tons.

TRENTON POSTOFFICE.

Grundy County Coal Co.—Mine located one mile southeast of Trenton, and connected with the Chicago, Rock Island & Pacific railroad; shaft 170 feet deep and operated by first-class machinery for hoisting. A 10-foot fan is used for furnishing the ventilation, the same being set on top of an air chamber which is partitioned off from one end of hoisting shaft. I visited this mine in January, but failed to make an inspection owing to the pulley wheels being taken down for repairs. On the 18th of March I returned and made a careful inspection. I found the ventilative current very weak in the southeast part of the mine, in fact the current was weak all over the mine. The roof on the south side is very poor, it contains considerable water and falls very often in the face of the workings, thus shutting off the ventilation. Nearly all the works on that side had been abandoned owing to the bad roof. The shaft bottom is very much in need of timbering as well as other portions of the mine. Roadways are low, wet and muddy and entirely too much economy is practiced for the good of the mine. Coal 18 inches thick and worked on the long-wall plan. About 120 men employed; pay \$1 per ton for mining. Coal consumed by the railroad company in coaling engines. It stands high as steam coal.

GALT POSTOFFICE.

Norman Janes is operating a mine at Galt, on the west side of the city; shaft 210 feet deep and operated by steam-power for hoisting. This is the same seam as that worked at Trenton; coal 16 inches thick and worked on the long-wall plan. While the mine is located near the Q., O. & K. C. R. R., as yet no shipping connection has been made with it and the capacity is limited to the local demand; coal consumed at Galt; about 8 men employed.

HENRY COUNTY.

Production, 78,551 tons.

The coal product of Henry county has shown a small decrease during the year ending June 30, 1896, as compared with the preceding one. The entire county is underlaid with the coal measure formation, and mining is prosecuted in every township in the county; however, many of the mines are small and are limited to supply the local trade. The principal mines are located at Calhoun, Clinton, Brownington, Deepwater and Lewis station. The K. C., S. & O., K. C., Ft. S. & M. and M., K. & T. railways passing through the center of the coal field, furnish good shipping facilities for the product. There are reports from 30 mines, large and small, represented in the statistical table of this county.

These 30 mines produced 78,551 tons of coal during the past year; price received \$1.37 per ton at the mine, or a total valuation of \$107,784; in producing this amount of coal, 338 men were employed during the year. Following is a description of the mines, of their location and sanitary condition as found at dates of inspection.

BROWNINGTON POSTOFFICE.

Colorado mine.—Located one mile south of Brownington, and connected with the Bailey road by a switch; shaft 85 feet deep; steam-power used for hoisting; ventilation is furnished by a 12-foot fan, with fairly good results; coal 3 feet thick; the method of mining has been changed from the room and pillar to the long-wall plan, which has proved a success. The mine was formerly operated by Bean & Tilly, but is now owned and operated by D. C. Blanchard & Son. From 20 to 30 men employed; most of the product is consumed by the railroad company.

Mantle & Son Coal Co. (formerly owned and operated by D. C. Blanchard & Sons).—Mine located 4 miles south of Brownington; shaft 40 feet deep; horse-power used for hoisting; ventilation is produced by the aid of a fire basket located at the foot of the air shaft. Poor results are obtained owing to defective doors and curtains. Instructions were given to have the defective doors and curtains repaired. On my second visit to the mine on May 19, I found it nearly full of water. Coal 3 feet thick and worked on room and pillar double-entry plan; from 6 to 8 men usually employed. Coal is hauled from the mine in wagons and loaded on cars at Eaton switch, and shipped over the K. C., Ft. S. & M. R. R. and consumed at local towns along the line of the road. Pay for mining 80 cents per ton.

Terrell Co-operative Coal Co.—Mine located between Brownington and Deepwater and connected with the Bailey road. Shaft 25 feet deep; hoisting done by horse-power. Coal 3 feet thick and worked on the room and pillar plan. From 15 to 20 men employed; 95 cents per ton is paid for mining in winter and 75 cents in summer for screened coal. The product is consumed at local towns along the line of the road.

R. L. Thompson & Co.—Mine located half way between Brownington and Deepwater; connected with the Bailey road by a switch; shaft 50 feet deep; hoisting by steam-power and ventilated by a fan. I made the first inspection of this mine October 31 and found the ventilation very fair, but the mine otherwise in a miserable condition; in fact, very little attention was given it, and on my second visit, May 19, I found it closed down and abandoned.

CALHOUN POSTOFFICE.

Edwards & Minish operate a mine near Calhoun; slope opening; coal 30 inches thick and worked on the room and pillar plan, with 5 men employed; mining paid for at the rate of 80 cents per ton; coal consumed at Calhoun and vicinity.

B. F. Mundy operates a mine between Calhoun and Lewis station; slope opening; coal 4½ feet thick and worked on the room and pillar plan; located some distance from the railroad; this mine is limited to the local trade; however, small shipments are made to points along the Missouri, Kansas & Texas railroad.

Calhoun Coal & Lumber Co.—Mine located 2 miles southwest of Calhoun, and connected with the Missouri, Kansas & Texas railroad. This mine was closed last year and has not been in operation during the past year.

CLINTON POSTOFFICE.

Hancock Coal Co.—Mine located 1½ miles southeast of Clinton; shaft 32 feet deep; horse-power; coal 24 inches thick. During last fall and winter this company mined considerable coal by stripping and hauled it from the mine in wagons to Clinton.

William England is operating a mine on his land to supply home trade. Mine entered by vertical shaft, 25 feet in depth, and hoisting by horse-power.

McLeod mine, located two miles south of Clinton. Shaft 30 feet deep; horse-power. Coal two feet thick, and operated on the room and pillar plan. Ventilation is supplied by a small furnace. Coal consumed at Clinton.

Stockton Bros. operate a mine on the Avery land. Shaft 30 feet deep; horse-power. This mine is working the same seam of coal as that worked at all the other mines in this locality, and other conditions are the same. Few of the mines have ventilating appliances, as they are operated during the winter months only, at which time natural ventilation is sufficient to give all the air required for the few men employed. The product of all the mines in this locality is taken to Clinton.

Emory & Bogard Coal Co.—Mine located at North station, and connected with the K. O., Ft. S. & M. R. R. by a switch. Shaft 75 feet deep; equipped with machinery for hoisting. Ventilation is furnished by a fan, which was giving very poor results. The fan is very poorly constructed, and the airways small and much obstructed by dirt, and as a result the ventilation is very defective. My efforts to remedy these defects have failed, for the reason that I find a new party operating it at every visit I make. A new shaft is now sunk and will be used for hoisting, and the old shaft will be used for an escapement. The machinery will be moved, reset and the underground conditions of the mines improved. Coal three feet thick and worked on the room and pillar plan. Very little work has been done here during the past year.

Theodore Gehart is operating a mine east of Clinton; coal 4 feet thick; product consumed in the neighborhood.

DEEPWATER POSTOFFICE.

Braun Coal Co.—Mine located 4 miles south of Deepwater; shaft 50 feet deep, horse-power; coal 3 feet thick and worked on the room and pillar plan. It is hauled from the mine in wagons and loaded on cars at Eaton switch, and shipped over the K. C., Ft. S. & M. R. R., and consumed at local towns along the road.

John Hurst—Mine located 4 miles south of Deepwater; slope opening; coal 3 feet thick; mine ventilated by a furnace, which was giving good results at dates of inspections, October 31 and May 19. Mode of mining and other conditions same as at other mines in this locality; 16 men employed, and 80 cents per ton paid for mining.

Central Coal Co.—Robert Barr, superintendent. Mine located near Deepwater, and connected with the K. C., Ft. S. & M. R. R. by switch. Shaft 60 feet deep, and equipped with good machinery for hoisting. Ventilation is furnished by a 14-foot ventilating fan, which passes a strong current of fresh air around the face of all the workings, and the mine is kept in good condition with the requirements of the laws fully complied with. All the safety appliances were found in

good repair at dates of inspection. Coal 3 feet thick and worked on the long-wall plan; employment is given to 35 men. Prices paid for mining 85 cents per ton in winter and 75 cents in summer for screened coal. The product of the mine is consumed by the railroad company.

Rees & Son.—Mine located 4 miles south of Deepwater; slope opening, and hoisting by horse-power. The old slope has been abandoned and a new one opened near by. Ventilation is supplied by a small furnace, giving very fair results. Thickness of coal and mode of mining same as at other mines in the neighborhood. The entire output of the mine during the past year was consumed at the tile and brick works at Deepwater. From 10 to 15 men employed, and paid for mining at the rate of 80 cents per ton screened coal.

Chas. Pomeroy, formerly operated by McFadden. Mine located in the brush, 4 miles south of Deepwater. Thickness of coal, mode of mining and other conditions same as that of other mines in the vicinity. An average of 6 men employed.

A. Newbill is operating the California mine. Coal hauled in wagons from the mine and loaded on cars and shipped to market over K. C., Ft. S. & M. R. R.

H. H. Stephens.—Mine located between Brownington and Deepwater, on the old Hobbs farm. Mine entered from the bottom of an old strip-pit, and ventilated by a small furnace. Coal 3 feet thick, and worked on the room and pillar plan. It is taken away from the mine in wagons and consumed at the brick works and in the surrounding country. About 8 men employed.

I. W. Hurst.—Mine located near Deepwater, and operated during fall and winter to supply local trade.

LEWIS STATION POSTOFFICE.

Co-operative Coal Co.—I. M. Johnson, superintendent; mine located north of Lewis station, and connected by a switch with M., K. & T. R. R. Shaft 75 feet deep and operated by steam-power. Ventilation is produced by a 10-foot fan and the mine is well ventilated and kept in good condition. Coal 28 inches thick and operated on the long-wall plan, paying 70 cents for mining screened coal. From 20 to 30 men employed. Coal consumed at Sedalia and other points on the M., K. & T. railroad.

D. B. Pigg & Co.—This mine is located about 1½ miles northeast of Lewis station; drift opening. Coal is hauled on a tram road and loaded on the cars of the main line of the M., K. & T. R. R. Coal 30 inches thick and worked on the long-wall plan. Ventilation is produced by a furnace giving very good results. About 15 men employed, and 70 cents per ton is paid for mining screened coal.

Tebo Coal Co.—I. Bowen, superintendent. Mine located $1\frac{1}{2}$ miles east of Lewis station. Shaft 35 feet deep; hoisting by horse-power. Ventilation is furnished by a furnace and the mine is well ventilated. Coal 30 inches thick and worked on the long-wall plan. From 20 to 30 men employed, and 70 cents per ton is paid for mining. Coal consumed by the railroad company. Chutes have been erected here to coal engines.

WINDSOR POSTOFFICE.

L. W. Beaman operates a mine 6 miles north of Windsor, on the Miller land. Shaft, 35 feet deep, hoisting by a horse. Mine ventilated by a furnace and was giving very good results. Coal 5 feet thick and worked on the room and pillar plan. Mine is located so far from shipping facilities that the capacity of the mine is limited to the local demand. Coal consumed at Windsor and surrounding county.

J. W. Shook.—This mine is located on the Hines farm and is opened and operated on the same coal deposit as the Beaman mine. In fact, it is in the same locality, with condition of the mine and the thickness of the coal about the same. The product of this mine also is consumed at Windsor and surrounding neighborhood.

W. E. Hughes is operating a mine 2 miles south of Windsor. Shaft 25 feet deep, horse-power. Ventilation is furnished by a small furnace. Coal 5 feet thick and worked on the pillar and room plans. Gives employment to 6 or 8 men during the winter months. The coal is consumed in the immediate vicinity.

HOWARD COUNTY.

FAYETTE POSTOFFICE.

Enterprise Coal Co.—R. S. Cooper, superintendent; mine located southeast of Fayette, close to the city limits. Two drifts have been opened for the ingress and egress of the air, and coal has been taken out through both openings. Coal about 15 inches thick and of very fine quality, it is also claimed to be an excellent gas coal. It is mined on the long-wall plan, taken away from the mine in wagons and consumed at Fayette and vicinity. From 12 to 20 men employed during the winter; one dollar per ton paid for mining.

B. M. Lockridge operates a mine on his land to supply the local demand.

There are several other parties mining coal on the east and south of Fayette to supply local trade. The same seam underlies a large portion of Howard county as that so extensively mined at Higbee and other sections of Randolph county.

JACKSON COUNTY.

Production, 18,000 tons.

KANSAS CITY POSTOFFICE.

Brush Creek Coal & Mining Co.—R. M. Lamm, Supt. This is the only mine in the county. It is located 2 miles southeast of the city limits of Kansas City, near Brush creek. The shaft is sunk to the lower vein, which is 400 feet below the surface, but the seam worked is 80 feet above, or 320 feet to the landing. The mine is equipped with first-class machinery, the engine cylinders are 20×32 inches, connected direct to a 7½-foot drum, working on first motion; three large boilers have been erected to supply the steam-power. Ventilation is furnished by a 10-foot fan, which is giving satisfaction. The mine generates considerable gas, which comes from the slate roof over the coal, but it is soon rendered harmless by contact with the large volume of air. The ventilative current passes down the main shaft, and is divided at the bottom, to the north and south; it travels the north and south entries to their terminus, where it is again split to the east and west, passing the entire face of the workings from four currents; sufficient air is supplied to allow enough of it escape over the cross entries to keep them clear of gas, and in a safe condition. I made three inspections of this mine during the past year (November 15th, February 22d and May 18th.) I am pleased to state that I found the mine in a good sanitary, as well as a generally safe condition at each inspection, with the ventilation above the requirements of the law. The only safe-guard omitted by this company and demanded by the law, is a stairway or hoisting apparatus in the escapement shaft, for the purpose of rapidly clearing the mine of all employes in the event of fire or other accident to main shaft. The company was instructed to provide against such an emergency. The coal is about 18 inches thick, worked on the long-wall plan, with a moveable face track in use which is a great convenience to the miner in loading. The coal is overlaid with a strong shale roof, which makes an excellent top and requiring very little timber. The coal is of a very good quality, and we think it the same seam as that worked at Hamilton and Trenton. The mine has good shipping facilities, and employs from 60 to 90 men. One dollar per ton in winter and 87½ in summer is the price paid for mining. The product is consumed at Kansas City.

JOHNSON COUNTY.

KNOB NOSTER POSTOFFICE.

Knob Noster Coal Co.—Mine located at Montserrat and connected with the Mo. P. R. R. Shaft 200 feet deep; steam-power. The coal in this mine proved to be very inferior in quality, and failing to get a market for it, the mine was closed and abandoned.

DUNKSBURG POSTOFFICE.

R. C. Fisher is operating a mine near Dunksburg; coal $2\frac{1}{2}$ feet thick; mine operated to supply local trade.

MONTSERRAT POSTOFFICE.

John Boyd; drift opening; coal $2\frac{1}{2}$ feet thick; hauled in wagons, and loaded on cars at Montserrat and shipped over Mo. P. R. R. to local towns along the road.

P. H. Bullock, P. Lamb, John Thomas, Isaac Graves, James Graves, E. Hardin and the Herington Bros. operate drifts and slope mines at Bristle Ridge; the coal is hauled 5 miles in wagons, loaded on cars at Montserrat and shipped over Mo. P. R. R. to Sedalia and other towns along the line.

WARRENSBURG POSTOFFICE.

The following parties operate mines on a small scale in the surroundings of Warrensburg: I. M. Murray, M. B. Meiley, Henry Tanner and B. F. Wood. The product of these mines is consumed at Warrensburg.

There are other mines operated in the fall and winter at other points in this county which we had no time to visit, but their output will be found in the statistical table of this county.

LAFAYETTE COUNTY.

Production, 307,285 tons.

Lafayette county is the oldest coal-producing county in the State, as well as one of the largest producers; exceeded only by Macon county. Although the principal coal mined within her borders is a small seam as compared with some of the coal seams in other parts of the State, yet the nature of the roof, mining, quality of the coal, economic mode of working and the short haul to market form a combination of advantages which enables the operators of this county to place *their coal* on the market and compete with coal companies in other

parts of the State where a thicker vein of coal is mined. The Missouri Pacific and Chicago & Alton railways passing through her coal fields, furnish good shipping facilities for the product. During the past year there were 56 mines in operation, which produced 307,286 tons of coal, valued at \$1.38 per ton at the mines, or a total valuation of \$425,967.

In producing this amount of coal 1389 men were employed in and about the mines in winter and 576 in summer. The principal mines are located at Corder, Higginsville, Mayview, Lexington and Dover. Coal is also mined at other places throughout the county on a smaller scale to supply home consumption. Following is a description of each mine, with a statement as to their location and condition, as found at dates of inspection.

ALMA POSTOFFICE.

Henry Strathman.—Mine located near Alma; shaft 25 feet deep, horse-power; coal 18 inches thick, worked on the long-wall plan; local trade supplied; no shipments. There are two other parties in the same locality operating mines on a small scale during the winter months.

AULLSVILLE POSTOFFICE.

Geo. and J. T. Osborn each operate mines on their land to supply the home demand. The same seam is worked here as that at Corder and in other parts of the county, and the same method of mining is practiced.

CONCORDIA POSTOFFICE.

Walnut Grove Mine.—Operated by J. P. Henrick; mine located west of Concordia and operated during the fall and winter to supply local trade.

A. F. Kresse.—Mine located southwest of Concordia; shaft 20 feet deep; horse-power; coal 20 inches thick, worked on the long-wall plan; product consumed at Concordia.

Steinman Mine.—Operated by Henry Bartels; mine located west of Concordia, drift opening and operated to supply the local demand.

CORDER POSTOFFICE.

Corder Coal and Coke Co.—H. G. Smith, superintendent; mine located one-half mile west of Corder, and connected with the Chicago & Alton R. R. by a switch. Shaft 80 feet deep, and the coal is taken out by horse-power apparatus. On my first inspection of this mine I found the old shaft had been abandoned and the work confined to the new mine. Men were at work driving entries for a connection between

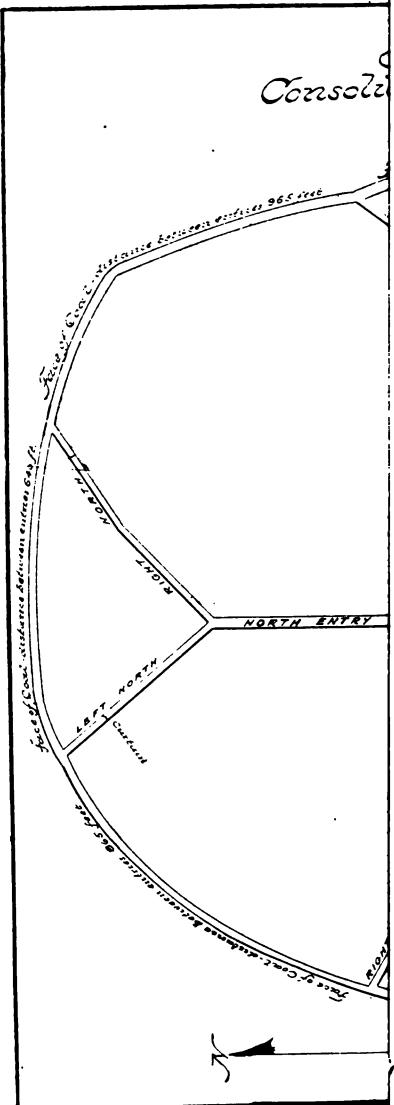
the two mines. March 2 I visited the mine again and found that the connection had been made. The air is now caused to pass down the old shaft, thence along the face of the workings, and out at the new shaft. The ventilative current is thus conducted by the aid of a furnace built on top of the shaft, which is not only an impractical but out-of-date method. The effect of the ventilating furnace when placed at the bottom of the shaft is to strengthen the natural current by imparting an additional heat to the up-cast column. It is most effective in deep mines, as its power depends upon the amount of air to which its heat can be communicated, and the longer the column of heated air in the shaft, in that proportion is the velocity of the ventilating current increased, as these conditions cause an additional length to the hot air column, consequently a brisker ventilation is obtained. The furnace should always be built at the bottom of the shaft, and there is no argument that I have ever heard to the contrary worthy of consideration when compared with the advantages offered as above. Coal 18 inches thick, worked on the long-wall plan. About 50 men employed at date of last inspection. The coal is shipped over the Chicago & Alton R. R. to Kansas City and other points west.

Salt Fork Coal Co.—Mine located one-fourth of a mile east of Corder, and connected with the Chicago & Alton R. R. Shaft 48 feet deep, and hoisting by horse-power. Ventilation is furnished by a furnace with very good results when properly attended to. Too much indifference is displayed as to the time the fire should be built in the morning; during the night while the fire is banked, or when burned out, circulation stops, and foul gases accumulate. The furnace should be started early enough to have all such accumulation swept away, and a steady stream of fresh air flowing through the mine before the miners enter it. The company was requested to give this matter immediate attention. Coal 18 inches thick, worked on the long-wall plan, with the moveable face track in use. Considerable rock has been removed from the roof of the entries, and mules will soon be placed in the mine to haul out the coal instead of men. Found 30 and 35 men at work respectively at dates of inspections, September 16th and March 2nd. Coal is shipped over Chicago & Alton R. R., and consumed at Kansas City and other points.

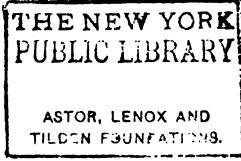
Daisey Hill Mine.—Operated by W. H. Bell. Mine located south of Corder, supplying local trade.

W. P. Morgan is operating a mine between Corder and Higginsville to supply home demand.

Consolidation



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DOVER POSTOFFICE.

Dover Coal Co.—Mine located two miles northeast of Dover and connected with the Lexington & Boonville branch of the Missouri Pacific railway; mine entered by drift and ventilated by a furnace, which was giving very fair results at dates of inspection; coal from 18 to 24 inches in thickness, and worked on the long-wall plan; roof good in places, except on the extreme east face; here some of the face of the breast had to be abandoned on account of bad roof; roadways wet and muddy in places; from 20 to 30 men employed; the coal is shipped over the Missouri Pacific railroad to Kansas City and points west.

N. F. Foe.—Mine located east of Dover; shaft 40 feet deep; horse-power; coal 18 inches, worked on the long-wall plan; ventilated by a small furnace; mine operated to supply the home trade.

HIGGINSVILLE POSTOFFICE.

Bonanza Coal Co.—Wm. Brandaw, manager; mine located 2 miles east of Higginsville and connected with the C. & A. R. R.; shaft 70 feet deep; equipped with good horse-power apparatus for hoisting; ventilation is furnished by a furnace and the mine is well ventilated; coal 18 inches thick, worked on the long-wall plan, and shipped to market over the Chicago & Alton R. R.; from 30 to 40 men employed. One dollar per ton is paid for mining during the winter and 75 cents in summer. Two inspections were made during the past year and the mine found in good condition at each inspection.

Consolidated Farmers Coal Co.—J. H. Campbell, general manager, and Wm. Ballow, general superintendent. This company owns and is operating 6 mines in the vicinity of Higginsville, which are great factors in the coal production of this county.

Mine No. 1 is located near the city limits on the west of Higginsville; shaft is 70 feet deep and operated by steam-power.

Ventilation is furnished by a 10-foot fan, and was giving satisfaction at dates of inspection: September 17th, November 11th and again on March the 3rd. The air is conducted around the mine in two turrents; it is forced down the fan shaft to the face of the south entry and then divided to the east and west; thence passing around the face of the workings, uniting again at the face of the north entry, from which point it returns to the up-east. The mine is worked very extensively, and the air has a long distance to travel and is very thick with black damp on its return; coal and mode of mining, the same as that of other mines in this vicinity.

Roadways high and mine in fair condition. About 75 men employed. Most of the coal is consumed at Kansas City.

Mine No. 2 is located 2 miles west of Higginsville, and connected with the Chicago & Alton R. R. Shaft 45 feet deep, equipped with steam-power for hoisting. Ventilation is furnished by a furnace and giving fair results, considering the long distance and contracted air-ways through which the air has to travel. Thickness of coal, mode of working and price paid for mining is the same as that at other mines in the county. About 40 men employed, and the output shipped to points west and northwest.

Mine No. 3, formerly known as Stealy & Fowler mine, located $1\frac{1}{2}$ miles southwest of Higginsville. Shaft 17 feet deep; horse-power. A connection is now made between this mine and No. 6, and the coal from both mines is now hoisted through No. 6; No. 3 is used as an escapement shaft.

Mine No. 4 is located $1\frac{1}{2}$ miles southwest of Higginsville. Shaft 20 feet deep; horse-power. The equipment of this mine burned down about a year ago, and has not been rebuilt, consequently the mine remained idle during last year.

Mine No. 5 is a shope opening. A few Bohemians have a contract from the company to load coal in cars at a given price. Ventilation is furnished by a furnace which gives satisfaction; coal 18 inches thick and worked on the long-wall plan; mine dry and in good condition.

Mine No. 6 is located one and a half miles southwest of Higginsville; shaft 28 feet deep, operated by horse-power. The mine well ventilated by a furnace.

A connection having been made between this mine and No. 3, the product of both mines is taken out here. The thickness of the coal, mode of working and the price paid for mining is the same as at the other mines of this company. The moveable face track is used at all the mines in this vicinity; about 50 men employed.

Mine No. 7, formerly known as the Rocky Branch Mine; it is a drift opening and located two miles southwest of Higginsville. I made two inspections of this mine during the past year, and found it in good condition. On all previous inspections of this mine deficiency in the ventilation was found, but on the 12th of November when I visited it I found that a new air shaft had been sunk on the hill, and a new furnace built as suggested by me on a former inspection; the ventilation was double the amount required by law, and the mine in good condition. Mines Nos. 3, 4, 5, 6 and 7 are located on the Rocky Branch switch, and have shipping connection with both the Chicago & Alton and the Missouri Pacific railroads. All mines of this company are

operated on the long-wall method and using the moveable face track. One dollar per ton is paid for mining in the winter months and 75 cents in summer; about 300 men are employed in winter and 100 in summer. The product is consumed at Kansas City and points west and northwest.

Farmers' Coal Co.—Thos. Thomas, superintendent. This mine is located one mile southwest of Higginsville and has shipping connection with the C. & A. and Mo. P. railways by a switch; shaft 38 feet deep, and hoisting by horse-power; ventilation is furnished by a furnace and the mine is well ventilated; a large volume of air was found passing around the entire face of the workings; coal 18 inches thick, worked on the long-wall plan and the moveable face track in use; from 40 to 50 men employed; one dollar per ton is paid for mining in the winter and 75 cents in summer. The output is consumed at Kansas City.

Farmers' Coal Co.—Mine No. 3; Thos. Thomas, superintendent. This mine was formerly operated by Bruce & Noble; it is located two miles southwest of Higginsville and has shipping connection with the C. & A. and Mo. P. R. R.'s by a switch. The shaft is 25 feet deep; hoisting by horse-power; ventilation is produced by a furnace, with good results. Two inspections were made during the past year and the mine found in good condition at each visit. Thickness of coal, mode of working and price paid for mining is the same as that at other mines of this county; about 40 men employed; coal consumed at Kansas City and other points.

Hagood Coal Co.—Mine located on the same switch as the Farmers mine and has the same shipping facilities; it is located half a mile northwest of the latter and one and a half miles southwest of Higginsville. Shaft 20 feet deep; horse-power; mine well ventilated by a furnace, and worked on the long-wall plan. One dollar per ton is paid for mining in winter and 75 cents in summer. From 10 to 15 men employed; coal consumed at Kansas City and points west.

Frank Coleman operates a drift mine to supply the local trade.

Chas. E. Dukan operates a mine east of Higginsville; drift opening; coal 18 inches thick, worked on the long-wall plan, and hauled in wagons and consumed in the surrounding country.

Hughes & Son.—Mine located one mile west of Higginsville; shaft 72 feet deep and operated by horse-power; ventilated by a furnace, which is located near bottom of hoisting shaft, and giving good results. This mine while located on the line of the C. & A. R. R. has no shipping connection with it, and though limited to the local demand it makes a very good showing of output yearly. Coal 18 inches thick,

worked on the long-wall plan; employing from 15 to 20 men. Coal consumed in the vicinity.

Frank Thomas operates the mine formerly operated by Taggart & Anderson. It is located two miles southwest of Higginsville; slope opening, and worked on the long-wall plan; coal taken away in wagons and consumed in the vicinity.

Bond & Terry are operating the mine formerly worked by Henry Fraeschle. Drift opening; coal hauled in wagons to Higginsville, where it is consumed. There are other mines in this neighborhood operating on a small scale which we had no time to visit.

LEXINGTON POSTOFFICE.

Lexington is the oldest mining town in the State. Mining has been prosecuted in its vicinity for nearly 50 years and the output is yearly increasing. There are about 20 mines, large and small, in the immediate surroundings of Lexington, giving employment to about 1000 men and boys. All the coal mined at this point, with the exception of the home demand, is shipped to market over the Mo. P. R. R. to Kansas City and points further west. Following is a description of the several mines and their location, together with statement of the condition in which we found them at dates of inspection, September 18 to 23 and again March 6 to 10.

Bell & Greer.—Mine located south of Lexington; ventilation secured by a small furnace, but sufficient for the capacity of the mine; it has two drifts openings for the inlet and outlet of the air; coal 18 inches thick, worked on the long-wall plan, and hauled away from the mine in wagons and consumed at Lexington; from 8 to 15 men employed.

A. O. Malley operates a mine near the above-mentioned; shaft 25 feet deep; horse-power; running in winter to supply local trade.

Keist & Rieley.—Mine located one mile south of Lexington; shaft 60 feet deep; operated by horse-power and ventilated by a furnace, which is located near bottom of hoisting shaft and giving good results; coal 18 inches thick and worked on the long-wall plan; the output is consumed at Lexington; 6 men employed.

M. Hollwell operates a mine located within the city limits. Shaft 60 feet deep; horse-power. Coal 18 inches thick, worked on the long-wall plan, and ventilated by a furnace. The product is consumed at Lexington.

O. M. Goffin is operating a mine on the east of the Hollwell mine, and has an underground connection with the latter mine. Shaft 60 feet deep and operated by horse-power. Thickness of coal, mode of working and price paid for mining the same as that of other mines in

the county. Coal consumed at Lexington. An average of 6 men employed.

John Boncum operates a mine west of Lexington, to supply home trade.

The Clark mine is operated by Theodore Altschaffer; it is located east of Lexington, on the river bank. Mine entered by a drift, and ventilated by a furnace. The airways have been cleaned during the past year, and a new smoke-stack built, and the ventilation was found better than on any previous visit. There were 8 men employed. The coal is consumed at Lexington.

The Spruce mine is located east of Lexington, and is classed as one of the city mines; operated in fall and winter to supply local trade.

Thos. Walton operates a mine on the east side of the Spruce mine which has an underground connection with the latter. Both mines are ventilated by the same furnace, which is located at the entrance of the Walton mine. Coal consumed at Lexington.

Hays Coal Co.—Formerly known as Lafayette Coal Co.; mine located 5 miles east of Lexington, and connected with the Boonville & Lexington branch of the Missouri Pacific R. R. Drift opening, and mine ventilated by a furnace, with good results. Thickness of coal, mode of working and price paid for mining the same as that of other mines in the vicinity. About 30 men employed, and the product shipped to Kansas City and other points.

Lexington Coal Co.—Major R. M. McDowell, general manager; B. F. Wiley, superintendent. This company operates six mines in this county, but only four of them have been in operation during the past year. All the mines are located on the south side of the Missouri river east and west of Lexington, and have shipping connection with the Boonville & Lexington branch of the Missouri Pacific R. R. The mines are all worked on the long-wall plan, and the price paid for mining is the same as that of other mines in this locality. The coal in the mines of this company is about the same thickness as that of the other mines in this district, except that found in the McDowell and Riverton mines east of Lexington, which runs a little thicker than the average. The mines are all well ventilated, and requirements of the mining law closely observed. The roadways are high, wide and dry, and in good condition.

Graddy Mine.—Drift opening; located $2\frac{1}{2}$ miles west of Lexington. The mine is ventilated by two furnaces, one on each side of the mine. The air enters at the mouth of the drift and travels the main south entry to its terminus, and splits to the east and west, from which point

it returns to the furnaces. The mine has been worked very extensively, and the airways are long, but too small, retarding the progress of the air to a great extent and causing a deficiency at some points. The company contemplates sinking a new air shaft near the face of the workings. The coal at this mine is undermined by an electric plant, of which particulars have been given in a previous report; 80 men employed.

The Seawell mine is located one mile west of Lexington at Meyrick station. Drift opening; mine was found well ventilated by a furnace, and in good condition on both visits of inspection; 60 men employed.

McDowell shaft, Pete Harde, foreman. Mine located east of Lexington. Shaft 55 feet deep, operated by machinery and ventilated by a fan which was causing 19,230 cubic feet of air to circulate around workings at first inspection. An underground connection has been made between this and the Riverton mine, and the east side is ventilated from the latter. The mine is well ventilated and all other requirements of the mining laws are fully complied with. Two doors are hung on each cross entry, and are located so far apart that one is always closed before the other opens. Roadways are high, wide and dry, and in good condition. About 100 men employed.

The Riverton mine is located one mile east of the McDowell mine, and has an underground connection with the latter mine. Drift opening and ventilated by a furnace; the air enters at the mouth of the drift and travels over the south entry to the face where it divides to the east and west; the current traveling to the east side ventilates the face of the workings and returns to the furnace, while the current on the west side returns to the upcast of the McDowell mine after accomplishing its work. The ventilation was above the requirements of the law at each visit of inspection. Thickness of coal, mode of working and price paid for mining is the same as that of other mines in this county. The product of the mines is taken to market over the river branch of the Mo. Pacific, but a large portion is used by the railroad company in coaling engines, as the coal has a reputation for making steam. Roadways high, dry and clean, and the mine in excellent condition; 120 men employed.

The Southwestern Coal Co.—Mine located at Lexington, near depot; shaft 125 feet deep; equipped with first-class machinery for hoisting. The mine is well ventilated by a 10-foot fan. I made the first inspection of the mine September 19th and found considerable water flowing in from the old abandoned mines on the northeast. I visited the mine again on the 7th of March, but made no inspection, as was idle, and we are informed that the water is about getting to

best of it. It is equipped with the very best of machinery, practically opened, and every effort has been made by the company to make it a first-class mine; we would like to see the company make a success of it. Coal 18 inches and worked on the long-wall plan and shipped over the Missouri Pacific railroad to Kansas City and other points; 55 and 10 men at work respectively at dates of inspection.

The McGrew mines are located about 3 miles west of Lexington and connected with the Missouri Pacific railroad. Both mines have drift openings; worked on the same coal face and are ventilated by the same fan; for all practical purposes may be considered as one mine with two openings. The air enters at Mine No. 1 and travels to the extreme east face of the works and thence westward along the face of the work until it reaches Mine No. 2; thence into another opening, where the fan is located. Some air also passes in at Mine No. 2 and unites with that of No. 1 on its route to the fan.

The ventilation is good all over the two mines and other requirements of the law fully complied with. All the entries are high, wide, dry, clean and in excellent condition. Coal 18 inches thick and worked on the long-wall plan, with the moveable face track in use. The coal is taken to market over the Mo. P. R. R. and consumed at Kansas City and points west; 87½ cents per ton is paid for mining in winter and 75 cents in summer; about one hundred men employed at both mines.

The Maceey mine is located 2 miles west of Lexington, and has shipping connections with the Missouri Pacific railroad. Drift opening; coal 18 inches thick, worked on the long-wall system and ventilated by a furnace, which was giving satisfactory results at date of inspections, September 18 and March 6. From 30 to 40 men employed, and the product shipped and consumed at Kansas City and other points.

James Roswell.—Mine located one mile northeast of Lexington; shaft 85 feet deep and operated by horse-power for hoisting. The mine is well ventilated by a furnace, and is operated on the long-wall system and the product consumed at Lexington.

MAYVIEW POSTOFFICE.

Mathews Coal Co.—W. B. Wilson, superintendent; mine located one mile east of Mayview and has shipping connection with the Chicago & Alton railroad; shaft 105 feet deep, and operated by machinery for hoisting. The mine is ventilated by a furnace which was giving good results at date of inspection. Coal 17 inches thick, worked on long-wall plan, with the moveable face track in use. Coal consumed at Kansas City and points west. About 60 men employed.

This company owns another mine one-fourth of a mile west of depot, with shaft sunk to the same seam of coal as the other mine; it is equipped with good machinery, but as no work has been done here the past year no inspection was made.

J. J. Northfleet is operating a mine in the vicinity of Mayview to supply local trade.

NAPOLEON POSTOFFICE.

Brown & Bowers Coal Co.—Mine located one mile east of Napoleon, and connected with the Missouri Pacific railroad; shaft 60 feet deep, equipped with steam-power for hoisting. Ventilation is secured by a furnace and was giving good results at date of inspection. The plant burned down about the latter part of February, and has not been rebuilt.

WAVERLY POSTOFFICE.

Waverly Coal Co.—Mine located at Waverly and connected with the Mo. P. R. R.; shaft 105 feet deep; equipped with steam-power for hoisting. Ventilation is secured by a fire basket hung at the foot of the air shaft. Coal 44 inches thick and worked on the pillar and room plan. Very little mining has been done at the mine during the past year.

WELLINGTON POSTOFFICE.

A. Carter & Son.—Mine located two miles east of Wellington and connected with the Mo. P. R. R.; drift opening; coal 18 inches thick, worked on the long-wall plan and ventilated by a furnace. About 10 men employed, and 87½ cents per ton paid for mining in winter and 75 75 cents in summer. The product is consumed at Kansas City.

J. M. Seawell & Co.—Mine located about a mile west of Wellington and connected with the Mo. P. R. R.; shaft 45 feet deep; horse-power; thickness of coal, mode of working, and price paid for mining are the same as that at other mines in this county. Ventilation is secured by a furnace giving good results at dates of inspection; about 30 men employed.

There are other parties in different parts of this county operating small mines to supply the home consumption.

LINN COUNTY.

Production, 92,022 tons.

This county in 1891 and 1892 ranked eleventh in coal production of the State; in 1893 it ranked tenth; in 1894 it ranked ninth; in 1895 it ranked eighth, and in this report it ranks seventh, with an output of 92,022 tons for the past year and which was sold at the mines for \$140,

207, or an average of \$1.52 per ton. In producing this amount of coal six mines were operated and an average of 278 men were employed. The principal mines are located at Brookfield and Marceline. Following is a description of the mines as found at dates of inspection:

BROOKFIELD POSTOFFICE.

Brookfield Coal Co.—F. F. Smithers, president; Chas. Cartwright, superintendent; mine located $\frac{1}{2}$ mile east of Brookfield and connected with the Hannibal and St. Joe railroad; shaft 155 feet deep and operated by machinery for hoisting; ventilation is furnished by a furnace and the mine fairly well ventilated. I visited the mine on the 10th of September, but as it was not running at that date no inspection was made. I visited the mine again in May and found the men on a strike against a reduction in the price of mining. A switch has been put in during the past year to load coal on cars, which has increased the output of the mine. Coal about 28 inches thick, but there is a layer of black-jack running through the center of the coal about 8 or 10 inches in thickness, which has to be picked out and thrown away, leaving only about 18 inches of coal. It is worked on the long-wall plan and employs about 35 men. Most of the coal is consumed in the surrounding country; some, however, is shipped over the H. & St. Joe R. R.

Bottomly Mine.—Located $1\frac{1}{2}$ miles east of Brookfield; shaft 150 feet deep; horse-power, coal 28 inches thick and worked on the long-wall plan and ventilated by a furnace; coal consumed at Brookfield; 6 men employed.

The Clark mine is now operated by Frifield & Cox; shaft 150 feet deep, operated by horse-power, and ventilated by a furnace; coal 28 inches thick and worked on the long-wall plan; coal consumed at Brookfield and vicinity.

Bernard Shafer.—Mine located 3 miles northeast of Brookfield; shaft 155 feet deep, using horse-power for hoisting; mine operated on the long-wall plan, and ventilated by a small furnace; the coal is taken away in wagons and consumed at Brookfield and vicinity.

MARCELINE POSTOFFICE.

Marceline Coal Co.—Joseph Hemming, superintendent; John Burns, foreman. Mine located at Marceline and has shipping connection by a switch with the Santa Fe railroad. Shaft 187 feet deep, and equipped with first-class machinery for hoisting. The mine is ventilated by a 14-foot fan, which was running at a speed of 55 revolutions per minute at date of inspection, and was passing 14,380 cubic feet of air on the east side and 16,970 cubic feet on the west side in the same length of

time. This volume of air was circulating around the mine in four separate currents and returning to the upcast from the west side over an air crossing. Two inspections have been made of this mine during the past year. First inspection was made September 11th and the ventilation was found above the requirements of the law in all parts of the mine, except the 5th and 6th east off the south entry; here the ventilative current was weak, owing to the use of curtains instead of wooden doors. There were 215 miners, 9 mules and 9 mule drivers at work at this date besides day hands. I visited the mine again on the 15th of February, but as the same was not in operation that day no inspection was made. May the 5th I made another inspection, but the mine was not hoisting and only part of the miners at work; no test of the air was made. I found one of the cages without a cover, and the approach to the escapement shaft had caved in and closed; the attention of the company was called to this, and instructions given to open the escape shaft at once and to put a cover on the cage. I also noticed on this visit that too much economy was practiced in operating; the numerous repairs needed all over the mine plainly indicated the cause of its condition. Coal 28 inches thick and worked on the long-wall system. The roof is hard and strong and well adapted to the method of mining. About 250 men employed, and one dollar per ton paid for mining. Most of the product is consumed by the Santa Fe railroad company in coaling the engines, this being a very fine steam coal.

Landreth & Son.—Mine located near Marceline; shaft 130 feet deep; horse-power. Mine operated on the long-wall plan, and ventilated by a fire-basket. Coal is taken away from the mine in wagons, and consumed at Marceline and vicinity; about 6 men employed on an average.

LIVINGSTON COUNTY.

Production, 1155 tons.

CHILLICOTHE POSTOFFICE.

W. A. Cox is operating two mines 5 miles north of Chillicothe. Both are shafts, and the product is hoisted by horse-power. Coal 22 inches thick. It is hauled in wagons, and consumed at Chillicothe and the surrounding country.

The Postlewhite mine was operated during last winter by parties from Hamilton. This mine is located about two miles north of Chillicothe on the Milwaukee road. The shaft was sunk several years ago to a depth of 175 feet when an 18-inch vein of coal was struck, but for some reason the mine remained idle until last winter. I visited the mine in June and found it again idle and deserted.

MOORESVILLE POSTOFFICE.

Robert Ford.—Mine located at Mooresville. Shaft 70 feet deep and operated by horse-power. This is a new mine sunk in the summer of 1895. Coal about 18 inches thick and worked on the long-wall plan. It is supposed to be the same coal seam as that worked at Hamilton. Mine operated to supply the local demand, and the product is consumed at Mooresville and surrounding neighborhood.

MACON COUNTY.

Production, 519,649 tons.

Macon county continues in the lead of coal producing counties in the amount of coal mined. In 1891 she ranked second on the list, but for the past five years she has been at the head of the procession. The coal mined in the county during the year ending June 30, 1896, amounts to 519,649 tons, and the amount received for same at the mines was \$509,455, or an average of 98 cents per ton. In producing this amount of coal an average of 1166 men and boys were employed in and about the mines.

The principal mines are located at Ardmore, Bevier and Lingo; however, a number of small mines are located in the vicinity of College Mound, Macon City and other places throughout the county, operated in winter to supply home consumption. Following is a description of the principal mines, together with a statement as to their location, and the condition in which they were found at dates of inspection :

* ARDMORE POSTOFFICE.

Kansas & Texas Coal Co.—B. F. Hobart, president and manager; W. E. Merlin, superintendent. This company owns a large number of mines in this county, but owing to the small demand for coal, only two of the mines have been operated throughout the past year, one of which is located at Ardmore and the other at Bevier.

Mine No. 33 is a slope opening, and ventilated by a 12-foot fan. I made the first inspection of this mine on the 8th of January, and found a deficiency in ventilation in nearly every part of the mine. In fact not only was the ventilative current deficient in quality, but it was also so vitiated by the impurities of the mine which it gathered on its long route around the mine that it was rendered unfit to breathe.

All the coal outside of the 15th east entry had been worked out and that part of the mine abandoned and the work at this date was confined to the 15, 16, 17, 18, 19 and 20th entries on the east, the two

*See note end of Macon county.

main south, and the 11, 12, 13, 14, 15 and 16th entries on the west. The ventilating volume of air at this date was circulating around the mine in two currents. The 11th and 12th west entries were ventilated by one of the currents, and they were found fairly ventilated; while the other current was conducted around the 15, 16, 17, 18, 19 and 20th east entries, the two main south entries, and the 13, 14, 15 and 16th west entries. It should be remembered that the latter current had to travel about 9000 feet before it reached many of the miners, and I found 156 miners working in the one current, besides mules and mule drivers. I made a measurement of the air on the main return air-course and found only 5750 cubic feet of air per minute passing after ventilating the 156 miners, mules and drivers, and this small amount of air so thick with black damp, powder smoke and other impurities as to render it too vile and poisonous to inhale. The miners of this mine were thus confined all day in an almost stagnant and hourly thickening atmosphere, night finding them so weakened and prostrated by inhaling the foul and impure air all day, that they could hardly wend their way home. On my return to Jefferson City, after completing my tour of inspection of Macon county, I addressed a letter to the company describing the condition of the mines and requesting improvements in same. A copy of the letter and the answer to same will be found herein. I made another inspection of the mine on the 6th of May, the fan at this date was making 92 revolutions per minute, and 24,360 cubic feet of air was found passing on the main intake in same length of time. This volume was divided into 4 currents, one current was ventilating the 11 and 12th west entries, and another the 13th and 14th west entries. Still another was ventilating the 15th and 16th east entries, and the 4th current was ventilating the 17, 18, 19, 20, 21 and 22nd east entries, the two south entries, and the 15, 16, 17 and 18th west entries. The latter current was so much overloaded that another split was in course of construction at date of this inspection, and was to have been completed in a few days. I found the ventilation better at this inspection than on the previous one. The coal will average about 4 feet in thickness; worked on the double-entry room and pillar plan, and is mined by the unlawful system of shooting it off of the solid. The roof is soft and friable, requiring great care and expense to keep it properly secured with timber. About 200 men employed; 50 cents per ton is paid for mining unscreened coal. The mine has shipping connection with the Wabash railroad, which also consumes a large amount of the product of the mine.

BEVIER POSTOFFICE.

Mine No. 43 is located 1½ miles west of Bevier; shaft 140 feet deep and equipped with good machinery. The mine is ventilated with two fans, one of which is located near the hoisting shaft and furnishes the ventilation to the north side, while the other fan, which is located about 1500 feet south of hoisting shaft, ventilates the south part of the mine. I made my first inspection of this mine on the 5th of September and found the ventilation very fair, but only about 30 men were at work at that date. January 9 I made another inspection and found the 7th and 8th west entries had been driven through the fault; good coal was found and the mine opened new on the inside of the fault. The ventilation was very fair except in the 4th north off the 5th east on the south side; here it was so bad that several of the miners had to leave the mine on account of bad air. While there were about 150 men at work at this date, there was not a trappy in the mine, drivers had to attend to the doors, and as a result were often left open, causing a great leakage in the ventilative volume. Coal varies from 3 to 4 feet in thickness and is worked on the double-entry room and pillar plan. Fifty cents per ton is paid for mining unscreened coal. About 150 men employed. On my next tour of inspection of the mines of Macon county I found this mine temporarily closed.

Mine No. 46 is located 2 miles southeast of Bevier, and connected by a switch with the H. & St. Joe R. R. This is a shaft 168 feet deep, equipped with good machinery for hoisting. The ventilation is furnished by a 12-foot fan, which was doing very effective work and passing a large volume of air through the mine sufficient to properly ventilate every part of it if practically conducted. I made the first inspection of the mine on the 4th of September. The fan at this date was running at a speed of 92 revolutions per minute, and was removing 19,470 cubic feet of air on the main west entry in same length of time; but only 7260 cubic feet of this volume per minute was circulated around the 5th and 6th north entries where 102 miners were at work, thus showing a leakage of 12,210 cubic feet of air which was forced down one shaft and out of the other without material benefit to anyone. I found 131 miners, 13 mules and 13 mule drivers, besides day hands, working in the one current at this date, and a deficiency in the ventilation found in every part of the mine.

The east side of the mine was found fully as bad as the west side, cross cuts were all small and choked up with dirt; canvas doors were found hanging between the 3rd and 4th north off the straight east in place of wooden ones. I found 93 miners, 9 mules and 9 drivers

working in one current measuring but 7940 cubic feet of air. Deficiency in the amount of air was found in the 7th, 8th, 9th and 10th south entries, and the miners suffering for the want of it. I did not expect to find this mine in such a deplorable condition on this inspection, as I had the promise of Mr. E. J. Crandall that he would remedy all the defects that I have mentioned. On my previous inspection of this mine, June 27, 1895, I found it in bad condition, with the ventilation defective all over the mine. I notified the company of the facts, and requested immediate remedies. Mr. E. J. Crandall, the mine manager, answered me very promptly and made some very fair promises, as will be seen by his letter published in the 9th annual report of the mine inspector. Whether Mr. Crandall intended to fulfill any of these promises or not, or whether he was simply attempting to postpone action on my part, I do not know. The fact plainly remains that he did not fulfill a part of anything he promised, as two months latter I made this visit and found the condition of the mine as already described. Whereupon I again addressed the company as follows:

JEFFERSON CITY, September 14, 1895.

Kansas and Texas Coal Company, St. Louis, Mo.:

Gentlemen—While on my regular inspection of Macon county mines, I again visited mine No. 46 on the 4th inst. and was much surprised to find so little accomplished in the way of bettering the ventilation since my last inspection. I made a measurement of the air on the 6th north entry—west side, at same point where a previous measurement had been made, and while I found 1460 cubic feet more of air passing, yet there were 20 more men employed in same current. In other words, I found 7260 cubic feet of air being furnished 102 men as against 5800 cubic feet furnished 82 men. I made another measurement of the air on the return air-course near the bottom of upcast, on west side and found 19,470 cubic feet of air passing per minute.

Out of this large volume, however, only 7260 cubic feet were being conducted around the working places of the mine, thus indicating the enormous waste of 12,210 cubic feet of air per minute. Evidently something is wrong with the management permitting 62½ per cent of the volume of air entering a mine, and intended to circulate in the working places to be lost, and without answering the purpose for which it was intended. This failure I can account for from one of two things. Either it is an indifference to the law of the State regulating these matters, or very poor judgement in mine management.

The law provides for 100 cubic feet of air per minute per each man and boy in the mine, and 600 cubic feet per minute for each mule in the mine. The law also prohibits more than 50 men working in one current. You had at mine No. 46 at this date 131 miners, 13 mules and 13 mule drivers, besides day hands and trappers, all working in the one current on the west side, and that current measuring 7260 cubic feet of air per minute. I will ask you to figure this out and then answer me if I have room or reason for complaint. As heretofore pointed out in a previous communication it was shown that the air-courses were much too small and too much neglected. The size of the cross-cuts between the 1st and 2nd east entries off the 5th north is 3 feet 4 inches wide, and 3 feet 5 inches high, giving an area

7 10 feet and 8 inches to conduct a supply of air for 131 miners, 13 mules and 13 mule drivers.

The cross-cut between the 5th and 6th north is 4 feet wide and 4 feet and a half high. The air-course between 6th north and 7th south is nearly choked up with rock, and has been in that condition since last January, although I have ordered it cleaned several times. I found the air much worse in the southeast part of the mine than on the west side, as the size of the cross-cut between the 9th and 10th south entries off the 4th east entry was only 3 feet wide and 3 feet 4 inches high, and the men suffering for air in the 7th south off the 4th east. Still another curtain was found hanging between the 3rd and 4th north entries on straight east in place of a wooden door. There were 93 miners, 9 mules and 7 mule drivers besides day hands working on the east side on the 4th inst. with 7940 cubic feet of air passing per minute. This is not a pleasant matter for me to contend with and I dislike to annoy you with constant complaint; yet the demands of the miner and the requirements of the law make it necessary and obligatory on my part to call your attention to these defects. I have been lenient in these matters, but as your mine is getting in a worse condition every day, you will have to assist me in securing a better condition of things in your mine or I shall be compelled, much against my inclination or desire, to resort to such measures as the law require I shall use, to bring about a safe and lawful condition of affairs in your mine.

Yours very respectfully,

CHAS. EVANS,

State Mine Inspector.

No answer was made to the above by any officer of the company. The mine manager could not consistently do so and the higher officers were doubtless unaware of the true condition of the mine, trusting the subordinates who were paid to look after such matters and supposed to know their business.

Mr. Crandall, who was the mine manager and who had but a short time prior to this letter made such fullsome promises and failing utterly to make them good, indicated by his silence either a cool indifference as to the requirements of the mining laws or a want of a proper appreciation of the necessities of the mine which he was paid to look after. He did during the month of July visit the mine and consult with Mr. Merlin, its superintendent, but as both of them were lacking in the practical experience of underground work, the result of the consultation was as might be expected when the blind leads the blind. I made another inspection of this mine on the 7th of January. The fan at this date was running at a speed of 85 revolutions per minute, and was passing 21,240 cubic feet of air at the foot of the upcast in same length of time; on the west side of the mine only 5250 cubic feet of this volume was found circulating around the 5th and 6th north entries, where 64 men were at work. On the east side I found 15,765 cubic feet of air passing per minute at the bottom of the down cast, but only 4200 cubic feet was passing around this side of the mine where 86

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men and 9 mules and as many mule drivers were at work. The men working in the 7th, 8th, 9th and 10th south entries of the 4th east, were out on the entries after two o'clock in the afternoon, waiting for the smoke to clear out of their working places; they were nearly smothered for the want of air, while plenty of air, was forced down the mine, but was allowed to return to the upcast before reaching any of the miners; all of which was due to mismanagement and the inexperience of the superintendent of the mine, who has neither the practical nor the theoretical knowledge required to conduct the underground workings of a mine.

I can but repeat the warning heretofore given concerning the danger and impropriety of placing a man in the management and control of a mine whose experience is limited. Coal mines are so different from all surface work that it is absolutely necessary that one should be thoroughly acquainted and familiar with underground work to properly manage a mine. The want of practical experience on the part of a mine superintendent is too risky, and any company assuming such risk invites a charge of neglect. Such men are not only liable to injure the mining property, but to injure the health of the miners as well. Anticipating that this superintendent would not do anything even if he knew how to do it, I made another appeal to the company as follows:

JEFFERSON CITY, January 13, 1896.

Kansas and Texas Coal Co., St. Louis, Mo.:

Gentlemen—During the week ending January 11, 1896, I inspected three of your mines located in Macon county, all of which are under the one management, and the condition in which I found them I desire to acquaint you with herein.

Mine No. 33 was inspected on the 8th inst. I found in this mine 156 men working in the one current of air. Had this current provided the required quantity and quality of air, there would appear some excuse for it, but in addition to the fact that it is a violation of the law to work more than fifty men in one current of air, upon testing the quantity of air passing these 156 men, and from 10 to 12 mules, the meter registered on the main return air-course 5750 cubic feet; thus showing that only 37 cubic feet of air per minute was furnished each man working in the current without considering the amount required for mule-drivers and mules. This record is astonishing in the face of a law requiring 100 cubic feet of air per man per minute and 600 cubic feet per mule per minute. This air current being so deficient in quantity was the more readily vitiated by the impurities of the mine and its use by so many men and beasts; it was found simply vile and poisonous to the system. Time and again your company has been notified by me that defective doors and small airways were responsible for a lack of proper ventilation in your Macon county mines. The size and area of cross-cuts, through which the air has to travel has been furnished you, and I have your promises that these defects and all other requirements of the law would be made good. But so far I fail to see the effort for a betterment, and the present condition of your mines will attest to your failure in these matters. Several places in Mine No. 33 were found

untimbered, with loose rock hanging, making it very unsafe for the drivers and other employees to pass under it. I inspected Mine No. 43 on the 9th inst. and found the ventilation in a very fair condition. It was fresh and fully up to the requirements of the law, except in a few places on the 4th north off the 5th east entry, where it was deficient in quantity and impure as to quality. To make matters worse in such cases, the doors are left open while the drivers are in after their trips, as there was not a trapper to be found in the mine, which is still another violation of the law. I fail to understand why it is that a mine worked so extensively as No. 43 and employing 150 men should violate a law and waste the force and power of its machinery to avoid paying a few trappers 75 cents per day and inflicting an impure atmosphere upon its employes to breathe, when its machinery furnishes it to the mine in sufficient quantity and then be allowed to leak out and waste without performing the service it was intended for. I found places on the entries badly in need of timbering and altogether too risky for traveling. I shall not be surprised to learn any day that some employe had been caught unless soon cared for.

Mine No. 46 was inspected on the 7th inst. The fan was running at a speed of 85 revolutions per minute, and the meter registered 21,240 cubic feet of air passing at the foot of the down-cast on the west side; but owing to defective doors, leakages and small airways only 5250 cubic feet of the large volume of air first noticed was passing around the 5th and 6th north entries in which 64 men were at work, to say nothing of mules and their drivers. On the east side I found 15,765 cubic feet of air passing at a point near the bottom of the down-cast, but out of this volume there was only 4200 cubic feet conducted around the 7th, 8th, 9th, 10th, 11th and 12th south entries off the 4th east, and the 3rd and 4th east entries, where 77 men were at work. On the east side there was altogether 86 miners working in the one current of air. This is another violation of law. There are many places along the entries in dangerous condition and the mine generally in poor condition.

You will please give these matters prompt attention, as I shall visit the mines again in a short time and will expect to find them ventilated in accordance with law and all insecure places made safe. I also found section 7077, R. S., of the State mining law being violated. Coal is being shot off the solid at these mines and no shot-firers employed. As you have failed to comply with the law in this matter, a suit will be brought against you for each one of the mines so violating the law.

Please let me hear from you at as early date as possible.

Respectfully,

CHAS. EVANS,

State Mine Inspector.

It will be seen from the following reply that Mr. Crandall is not sufficiently practical as a mine manager to operate the mines of the Kansas and Texas Coal Co., in accordance with the mining laws of this State. The following is a copy of his letter:

BEVIER, Mo., January 27, 1896.

Mr. CHARLES EVANS, State Mine Inspector, Jefferson City, Mo.:

DEAR SIR—Your letter of the 13th inst, on the subject of the condition of mines of the Kansas and Texas Coal Co., in Macon county, Mo., came during my absence from the city. I note carefully the contents of same, and immediately took the matter up with Mr. E. Murlin, our superintendent, and had a thorough examination made of Mines 33, 43 and 46, particularly referred to in your letter.

In Mine No. 33 you state you found 156 men working in one current of air, but you made no mention of the two over-casts at the 15th and 16th east and the 13th and 14th west cross entries, which were then and had been for a week in course of construction, and to which your particular attention was called. There has been no time in the past year when the current of ventilation has not been split from two to three times.

The air even as it was in this mine was good, and every man in it was satisfied, and your statement that it was vile and poisonous I consider very much exaggerated, and one which we can disprove by the men working in that mine. You made no tests as to the quality of the air, except as it appeared to you in going through the mine. Other men working there regularly, old experienced miners, could as easily detect impure air, and would make it known very quickly to the pit boss, who they know would immediately take steps to see that the mine was ventilated.

You say your meter registered on the return main air-course in this mine 5760 cubic feet, thus showing that only 37 feet of air per minute was furnished each man working in this current, without considering the amount required by mule drivers and mules. We have taken some pains to test your measurements and statements regarding this matter, and find that with the fan making 85 revolutions per minute there was in the main air-course referred to by you, 16,940 cubic feet of air passing, instead of 5750 cubic feet, as stated by you. At the intake of the first split, being at the 12th west entry, there was 3934 cubic feet of air, at the intake of the 14th west entry we had 2200 cubic feet of air, and at the intake of the fifth split, on the inside of the 17th and 18th east entry door, we had 3074 cubic feet of air, or a total of 12,638 cubic feet at the four places, which certainly is not in accordance with your measurements, still we have good reasons for thinking that our measurements are practically correct.

We have not construed the law regarding the working of more than fifty men in one current of air in our mines, as it seems to be interpreted by you. We have no gas of any kind in our Macon county mines. We shall be glad to get your official interpretation of the law in this particular matter relating to the number of men we can employ in one current of air.

No one realizes the absolute necessity of good ventilation in a mine more than I do. It is the interests of the mine owners to have their mines properly ventilated, and my experience has been that the miners will not work unless they have good air, and it is very proper and right that they should not. We have always taken some pride in the fact that our facilities for ventilation and safety were the best.

You also touch up No. 43 a little. You state that the ventilation is in very fair condition, and it was fresh and fully up to the law, except in a few places on the fourth north off the fifth east entry. You also state that to make matters worse that the doors are left open while the drivers are in after their trips. If this is true, which the mine boss says is not the case, it will be corrected at once, as it is contrary to positive orders against such practices, and one which the miners at work would very quickly detect. You also state that there was not a trapper to be found in the mines, which is still another violation of the law. I can only say in regard to the employment of trappers in our mines that you simply are incorrect in your statement, as we do employ trappers at all our mines in Missouri, and there was one on the west side of the mine when you were there on the 9th of January, and he was looking after and attending the doors.

At No. 46, which you inspected on January 7, you say you found 15,765 cubic feet of air passing at a point near the bottom of the down cast, but out of this volume there was only 4200 cubic feet conducted around the seventh, eighth, ninth, tenth, eleventh and twelfth south entries off the fourth east entry and the third and fourth entries, where 77 men were at work, and that on the east side there is altogether 86 miners working in the one current of air.

Referring to the above I would say that we have taken the measurement of the air in mine No. 46 since your measurement, with the fan making 85 revolutions per minute, and found on the east side at the foot of the down east, 15,812 cubic feet of air passing per minute, and in the main return air-course for the seventh, eighth, ninth, tenth, eleventh and twelfth south entries and the third and fourth east entries which you mention as having 4200 cubic feet, we found 9460 cubic feet of air passing per minute.

I write you thus fully to show you that we are watchful as to the condition of our mines and have spent a large amount of money in our effort to have everything in and about them in a safe condition, and in all respects we are anxious to comply with the law. In the one matter at issue, that of our method of mining, we feel that we are in the right, and you take an opposite view, and we are satisfied to have the courts decide which is right and abide by the results. We shall do all in our power to comply with the laws of this State in the conduct of our business, and fully and sincerely believe we are doing so. I am, very truly,

E. J. CRANDALL, General Manager.

My duties in the field did not permit of my return to Jefferson City until the 1st of March, at which time the following reply was made to the above letter:

JEFFERSON CITY, March 1, 1896.

E. J. Crandall, Gen. Mgr. K. & T. Coal Co, St. Louis, Mo.:

Dear Sir—For you I have always entertained the greatest respect, the invariably kind treatment received from you in all matters of business has been such as to create this feeling, but I must confess to a profound surprise when I find you drawing conclusions from conditions not at all parallel.

The attempt to excuse the situation at your mines as you found them January 27, and as I found them three weeks previous and two weeks after your mine manager knew of my complaint to you, is not to my way of viewing matters exactly fair treatment. You seemingly ignore the fact that from the date of receipt of my complaints to the time you examined the mines for yourself and formed your conclusion, that an immense amount of work and change could be wrought in a mine. You forget that my reference to a mine is based upon its conditions at the time, having no authority to presume upon what its conditions may be in the future.

As to the wide variance in our measurement of air at No. 46, I have this to say: that the quantity of air passing on the day I made the inspection and reported to you is in exact accord with the facts with no desire on my part to represent other than the record of the matter. That conditions were changed between the time I made the measurement and the date you measured is entirely and altogether probable. I simply performed my duty, reported conditions as they were, and have reasons to believe that at the time, and for some time previous, as I had found them, that in my report I represented the normal condition of this mine for a certain period. I so reported to the pit-boss, and invited his inspection of measurements; also requested that he get the superintendent to come down with

me and that we would test each other with our respective meters. You state that you have not been able to construe the law relating to the working of more than fifty men in one current of air as I do. The law was enacted for the protection of the miner, it is now a mining law regardless of your opinion, and it is enough for me to know that it is the law of the State, and as such I am in duty bound to see it observed without reference to your opinion, which I consider in direct opposition to the very letter and spirit of the law.

The currents of air in a mine is a separate and distinct feature from that part of the law treating of gaseous mines, and even though currents of air were a part and feature of the clause relating to gaseous mines, the fact that the distribution of the air is left to the discretion of the Mine Inspector where conditions are of a special nature, does away with any loop-hole you imagine to exist. Your reference to Mine No. 33, the quality of air, the ability of the old and practical miners detecting impurities, reporting same to pit-boss is all very nice for the use of some people. But do you know that there is such a fear among your miners that though they might suffer and earnestly plead to me for help, yet refuse to testify before a jury to this effect for fear of discharge? Two of your men as honest and true as any in your employ, did dare under oath to testify the facts, and your company promptly discharged them. If you will remove the fear of discharge from your miners for telling the truth they will lift the scales from your eyes so adroitly placed upon them and reveal a condition of affairs that would astonish you. Five as good men as you have called my attention to the condition of the 4th north off 5th east mine No. 43 and others actually quit work on account of bad air.

I fear you imagine that I am influenced in my complaints by a feeling in opposition to your company. I wish to assure you that such is not the case. I endeavor to discharge my duties as inspector without fear or favor.

I can not afford nor have I the desire to do anything which may be considered unjust or unreasonable. Neither will I be swerved one iota from the strict compliance with my duties, by all the influence of your company, its money, lawyers or power.

Personally, I wish to assure you that any feeling toward you or your company is furtherest from my wishes or desire. The differences which have arisen between us is greatly regretted by me, and further evidence of this may be found by a perusal of my report which will be out next week.

Yours respectfully,

CHAS. EVANS,

State Mine Inspector.

The above reply to Mr. Crandall was based upon the presumption that he had promptly entered upon an investigation of the mine, and that he had personally gone down in the mine and made the measurements he so positively presented as correct. I cannot see how any one in reading his letter can avoid the inference that he had himself looked after the measurements and other matters under discussion. To add force to such conclusion is the fact that such was the proper thing for him to do, considering his position and the necessities of the situation. Yet I had my misgivings as to the genuineness of such impressions, though his assertion and the faithful performance of his

duties would force me to so believe; my thorough acquaintance with the mine and its surroundings on the other hand would in spite of me cause me to discredit his statements, and must confess that I was not greatly surprised on my next visit to the mine to learn from a foreman of the Macon county mines that Mr. Crandall had not been down in the mine to make the measurements and tests he claimed to have made in his letter to me. It was also stated and the statement corroborated by several, that Manager Crandall had never been known to go down in the Macon county mines. From all of which it is plainly to be seen that Mr. Crandall's statement was arrived at second-handed, and that, too, from one most deeply interested—whose hold upon his position was felt to depend upon the widest possible difference that could be made to appear as existing, between his measurements, and that of the mine inspector.

On my last two visits of inspection to Mine No. 46, I invited the superintendent of the mine to go down the mine with me and take the measurement of the air together, with our respective air meters, but he failed to comply with my request and without giving any reason therefor. On my visit to the mine on the 7th of January, finding the ventilation defective all over the mine (as stated in my report), I sent the pit-boss out to ask Mr. Merlin, to come down in the mine and bring his air meter and test the air current for himself, but he refused, or at least, failed to come. On my next visit to the mine on the 21st of April, I met Mr. Merlin, the superintendent, in the engine house on the morning before I entered the mine, and I asked him in person to get his air meter and go down the mine with me and take measurements of the air together. I told him that my former tests and measurements had been disputed, that I was confident that my tests were correct, and that I was right in every measurement taken, and that I would like for him accompany me down in the mine in order that tests might be made in the presence of each other and an opportunity afforded me to prove to him the correctness of former tests made by me. He not only failed to accompany me, but failed to furnish a reason for his refusal.

I can imagine but one reason for his refusal to accept of my offer, and that is that he well knew he could not find a volume of air circulating that would register to figures corresponding to the figures he furnished Mr. Crandall. Neither do I believe that he could produce the quantity of air in the measure described in Mr. Crandall's letter if he caused the fan to make 185 revolutions per minute. I firmly believe, because I am fortified by facts and figures, that the result of tests claimed to have been made and which were reported to Mr. Cran-

dall, were grossly exaggerated, by the evidence of careful tests made prior to and after his tests.

Having carefully read Mr. Crandall's letter and noting his numerous inaccuracies and its many inconsistencies, I could not banish the impression, that though he was the manager of one of our largest coal companies, and commanding the confidence of his superiors, that his position and the confidence imposed in him was greatly abused—for he clearly demonstrated his unfitness to manage and control the underground work of his company's mine. He visited the mines to investigate charges made against its superintendent, concerning the underground condition of the mine, and instead of going down in the mine to see for himself, he accepts the statement of the man against whom the blame is laid, and comes back at me with a letter refuting the charges made. Coal mines are not pleasant and agreeable places to investigate, but no man should control and manage a mine who does not frequently examine them throughout.

Mr. Crandall will not deny the fact that there were 156 miners, 10 mules and 10 drivers working in the one current of air at mine No. 33 at the date of inspection. But he says, "The air even as it was in this mine was good." Now let us see on what reasonable ground could he or any one else claim that the air was good in the mine, after contending with the following conditions, whatever its quantity might be. From where the air current first enters the mine at the mouth of the slope, to a point where it reaches the last of the miners working in the one current on the 13th west entry, it had to travel 9500 feet, contending with numerous bends and angles, over stagnant water, absorbing all the impurities of the mine on its long route, from the decay of materials and the organic matter constantly thrown off; ventilating 156 miners, from 10 to 12 mules and 12 drivers, with about 400 pounds of powder exploded at noon every day, the smoke from which the miners had to inhale every afternoon, with the respiration and perspiration of the men and animals, with the burning of so many lights; and in the face of all these facts this impractical mine manager has the audacity to plead that the air was good in the mine, and that I exaggerated when I said that the air was vile and poisonous.

I here again repeat the assertion that the air was vile and poisonous at date of inspection, and I have every reason to believe it had been in that condition for weeks and months, and there is nothing short of ignorance of the true condition that would attempt a denial of this fact. In his letter Mr. Crandall says that I made no tests as to the quality of the air, except as it appeared to me in going through the mine. What a ridiculous remark from a general mine manager! If

Mr. Crandall was a little more practical, or was in the least familiar with mining literature he would know that the best tests in foul and impure air is the flame of the lamp. I fully agree with Mr. Crandall in regard to the facilities for ventilation at the mines of the Kansas and Texas Coal Co. The ventilating appliances are of the very best; the mines are equipped with the very best of machinery, supplied with all modern improvements, and under the supervision of a practical mine manager the underground work of the mines could be kept in a healthy condition with such excellent facilities, instead of being operated in such a deplorable condition as they have been. In attempting to deny the facts reported in my letter in regard to hiring trappers at mine No. 43, Mr. Crandall says that the pit-boss told him that there was one trapper employed that day on the west side of the mine, where about 159 men and from 8 to 10 mules were at work. But the fact is, regardless of what Crandall or his pit-boss says about hiring trappers at that mine, that there was no trapper at his post of duty attending to any door on the east, west, north or south sides of the mine the day I made that inspection.

I made another inspection of Mine No. 46 on the 21st of April. The fan at this date was making 87 revolutions per minute and 15,900 cubic feet of air was found passing at the intake on the west side in same length of time; but fully two-thirds of this volume was lost through defective doors and stoppings before it reached the miners. I took a measurement of the air on the east side and the meter registered 19,380 cubic feet of air passing on the intake air-course before there was any chance for leakage, but on taking another measurement on an inside air-course leading from the 3rd east to the 2nd east entry I found only 7830 cubic feet passing per minute, showing the enormous leakage of 11,550 cubic feet of air every minute, which was allowed to return to the up cast without reaching any of the miners. There were 109 miners, 11 mules and 10 drivers, and several day hands working in that one current. I found the ventilation far worse in the 7th, 8th, 9th and 10th south entries on this visit than on any previous one. In fact I failed to enter two of the entries on account of black damp, and so far I have failed in my efforts to have these defects remedied, and very little improvement can be expected in the mine while under the present management.

The miners naturally expect the Mine Inspector to look carefully after the condition of the mines, and see that defects and evils therein are remedied at once.

Just here I desire to state for the benefit of the miners, for whom I have that fellow feeling due to my long experience as a miner myself,

that there are obligations on the part of the miners which they too frequently make it convenient to avoid. The miner should understand that no matter how faithful an inspector may be in the discharge of his duty, occasions do arise when he is powerless to perform his part without the co-operation of the miner. When the condition of a mine is such that the mining laws are violated and when persuasion and peaceful efforts fail to bring about desired and demanded improvements and a resort to the courts must be had, it should not be forgotten that the inspector has no other witnesses by whom he can prove his claim for a violation of the laws than the miners employed in the mine where the trouble originates. But when he finds miners under such abject submission to the domineering tactics of a mine superintendent like some companies are known to employ, the miners must expect as long as they act the pliant tool of such masters to suffer the consequences of working in an impure atmosphere; for by their own act they tie the hands of the inspector and thus become their own tormentors. Your inspector will ever be found ready to correct any abuse in conflict with the law or the health and safety of the miner, but he cannot fight the company lawyers and the men also on whose account suit has been brought.

The notes concerning the condition of the Kansas and Texas coal mines were written months since. At this time, however, the company has a new mine manager, one who is thoroughly equipped for his position by that practical experience so necessary in mine management. With the splendid equipment of this company and its most excellent facilities for operating, there is no reason why under its present mine manager the most satisfactory results should not be obtained. I anticipate with pleasure the most perfect accord between the new manager and myself in all matters relating to the mines and will most cheerfully aid whenever or wherever I can to this end.

Bevier Black Diamond Coal Co.—Thomas Francis, superintendent. Mine located $1\frac{1}{2}$ miles southwest of Bevier, and has shipping connections by a switch with the Hannibal & St. Joe railroad. Shaft 60 feet deep and equipped with good machinery for hoisting, draining and ventilating. I made three inspections of this mine during the past year and found it in good condition, with ventilation above the requirements of the law. I made the first inspection on the 6th of September. The fan at this date was making 100 revolutions per minute, and 22,462 cubic feet of air was found passing around the mine in same length of time. This volume was divided into three currents, but that portion of the current traveling on the south side was considerably vitiated by black damp and other impurities coming from the old

workings where the pillars were drawn. This made the air impure before it reached the 7th and 8th west entries. Instructions were given Mr. Francis to shut off the impurities by building stoppers. The ventilation on the north side was found stronger and fresher than on any previous inspection. January 9th I made my second inspection. The fan at this date was making 90 revolutions per minute, and was passing 21,550 cubic feet of air around the mine in same time. Tests were taken on both sides of the shaft and the ventilation was found satisfactory all over the mine. All the water had been taken out of the old slope and new works were opened out in that section. I visited the mine again on the 23rd of April and made another inspection. The fan at this date was running at a speed of 87 revolutions per minute and was passing 14,825 cubic feet of air on the south side and 17,390 cubic feet on the north side, which was the largest volume of air found at this mine on any inspection. Mine was otherwise found in good condition. The mine is worked on the double-entry room and pillar plan, and the coal will average from 4 to 5 feet in thickness. Fifty cents per ton is paid for mining unscreened coal. The product is shipped westward over the Hannibal & St. Joe railroad. Employment is given to about 150 men and boys.

Chicago and Northwestern Coal Co. (successors to Loomis Coal Co.)—Mine located one mile south of Bevier and is known as Mine No. 7. It has a shipping connection with the Hannibal & St. Joe railroad by a switch. Shaft 55 feet deep and equipped with good machinery for hoisting. Ventilation is furnished by a fan and the mine is well ventilated. Three inspections were made of this mine during the past year. First inspection was made on the 5th day of September, but as the miners were not at work and only one of the boilers generating steam no test of the air was taken. I found great improvement had been made at this mine since my last visit; entries and air courses had been cleaned and timbered and the mine was found in good shape. I made another inspection on the 10th of January and found the mine in excellent condition. The ventilation was found above the requirements of the law and the current well distributed around the workings.

On the 22nd day of April I made another careful inspection of this mine. The fan at this date was making 97 revolutions per minute and was forcing 23,555 cubic feet of air around the mine in same time. This volume was divided into two currents to the north and south respectively and giving entire satisfaction. The coal is about $4\frac{1}{2}$ feet thick and worked on the double-entry room and pillar plan. Mining is paid for at the rate of 50 cents per ton for unscreened coal. The

roof is a mixture of shale and soapstone, requiring care and much timber to keep it secured. The product is taken to market over the Hannibal & St. Joe railroad. About 125 men and boys are employed in the mine.

Watson Coal Co.—W. S. Watson, manager; W. M. Rivers, superintendent. Mine located $1\frac{1}{2}$ miles south of Bevier, and has shipping connections with the Hannibal & St. Joe R. R. by a switch. Shaft 85 feet deep, equipped with first-class machinery for hoisting; ventilation is furnished by a 12-foot ventilating fan, and the mine is well ventilated. Three inspections were made of this mine during the past year, and it was found in good condition at each inspection. First inspection was made on the 7th of September, the fan at this date was running at a speed of 58 revolutions per minute, and 17,380 cubic feet of air was found passing around the mine in same time; this was divided into two currents, giving plenty of air to all the working places. I made another inspection on the 11th of January, and found the mine in good condition with the ventilation above the requirements of the law. Made my third inspection of the mine on the 22nd of April; the fan at this date was making 70 revolutions per minute, and 20,100 cubic feet of air found passing around the workings in same time, and the mine otherwise in good condition. Coal about 4 feet thick, and worked on the double-entry room and pillar system. Mining is paid for at the rate of 50 cents per ton for unscreened coal. The product is taken to market over the Hannibal & St. Joe R. R. to Kansas City, St. Joseph and points west. About 100 men employed.

LINGO POSTOFFICE.

Little Pittsburgh Coal Co.—A. G. French, superintendent; Henry Howe, foreman. Mine located at Lingo, and connected with the Hannibal & St. Joe R. R. Shaft 135 feet deep, and operated by steam-power for hoisting.

The ventilation is produced by a 12-foot fan, and the mine is fairly ventilated. I visited the mine on the 9th of September, but as it was not in operation at that date no inspection was made. On the 14th of February I visited the mine again, and made a careful inspection; the fan at this date was making 77 revolutions per minute, and was passing 10,332 cubit feet of air around the face of the workings in same time. The ventilative current is divided into the different entries, a portion of the current is thus conducted fresh to all the working places. I found the mine in good condition on this visit.

I made another inspection on the 4th of May, and found the ventilation above the requirements of law, and the mine in good condition.

This mine is dry and very hot, the heat being caused from spontaneous combustion in the refuse of the mine. The coal is about 3½ feet thick, with a band of rock within 10 inches of the bottom, about 6 inches thick, which is a great drawback to the economical working of the coal. Mining is paid for at rate of 60 cents per ton for clean coal. About 70 men employed. The product is shipped over the Hannibal & St. Joe R. R. to points west.

MACON CITY POSTOFFICE.

Considerable mining has been done in and around the vicinity of Macon City during the past year, but only in a small way, to supply the home demand.

Most of the mines are located along the bank of the East Fork creek, and all drift openings. The coal is the same as that mined at Ardmore and Bevier and operated in the same manner. The output of these mines and other information concerning same will be found in the statistical table of this county.

W. J. Blanset and George White are operating a mine 4 miles east of Macon City; coal 24 inches thick and worked on the long-wall plan. Coal consumed at Macon City and vicinity.

We have been informed that parties are operating mines at Atlanta and La Platta, but we have not had the time to visit those places and investigate since we received this information.

MONTGOMERY COUNTY.

Production, 10,735 tons.

WELLSVILLE POSTOFFICE.

Vandalia Coal Co.—William Ralston, superintendent; the mine is located half a mile west of Wellsville, and connected with the Wabash railroad. Shaft 100 feet deep, using steam-power for hoisting. Ventilation is produced by an 8-foot fan, which was giving satisfaction at dates of inspection. Two inspections were made during the past year and mine found in good condition at each inspection.

The coal is about 32 inches in thickness and is worked on the long-wall plan. It runs very irregular and faulty on the south side of the mine, adding quite an expense to the cost of mining, and on my last visit to the mine I found that the south part had been abandoned, owing to faulty coal.

The mine is dry, with good high roadway and in good condition. Ten railroad chutes have been erected here to coal engines, and the

entire product of the mine is thus consumed by the railroad company. About 40 men employed.

Wellsville Black Diamond Coal Co.—Mine located one mile south of Wellsville; shaft 40 feet deep, and hoisting by horse-power; coal 26 inches thick and worked on the long-wall plan. Coal consumed at Wellsville and vicinity.

Buford Noel is operating a mine south of Wellsville to supply the local trade.

Samuel White operates a mine 3 miles southwest of Wellsville; drift opening, and supplying the home trade.

NODAWAY COUNTY.

Production, 6075 tons.

A number of mines were operated in the vicinity of Burlington and Quitman during the past year, but only in a limited way to supply the home trade.

The coal is about 16 inches thick, and is worked on the long-wall plan. The following parties have been operating mines here during the fall and winter seasons :

Thos. Bridges, Corydon Bird, Nichols Bros., William Manoregan, John Manoregan, Thos. Williams, Hal. A. Ware, C. W. Yetter, Henry Martin, W. W. Potts, Le. E. Carpenter, Ben. Larphey, F. C. Peirson, Fred Winslow, T. H. Howard, W. Smith, R. Eldsworth, Monroe Carpenter and H. Mason.

The output of the mines with other information concerning same will be found in the statistical table of this county.

PUTNAM COUNTY.

Production, 85,032 tons.

Putnam county ranks seventh on the list of the coal producing counties of the State. The county is largely underlaid with an excellent seam of coal, and in the northwest part of the county two workable veins have been discovered. The prediction is ventured that not less than 30,000 acres of coal in this county is as yet untouched by the operator, and it is our impression that Putnam county, in a few years, will be in the front rank of the coal producing counties. During the year ending June 30th, 1896, 85,032 tons of coal have been mined, which was sold at the mines for \$100,112, or an average of \$1.17 per ton. In producing this amount 13 mines were operated; a description of each is as follows:

BLACKBIRD POSTOFFICE.

Blackbird Coal Co.—Wm. Love, superintendent; mine located at Blackbird, and connected with the C. B. & K. C. R. R.; shaft 53 feet deep and operated by steam-power. The mine is ventilated by a 12-foot fan, which was making 75 revolutions per minute, and passing a strong current of air, but as the mine was not running at date of my first inspection, Dec. 10th, no test of the air was taken. March the 23rd I inspected the mine again, and found considerable improvement had been made in the underground workings, in the way of drainage; I also found the ventilation up to the requirements of the law, and the mine in very fair condition. Coal 33 inches thick, separated into two layers by a clay band two inches thick below the center of the vein. The coal is underlain by fire-clay mining, and overlaid by an excellent roof, well adapted for the long-wall method of mining, but the room and pillar plan is employed here. Price paid for mining is 60 cents per ton in summer, and 70 cents in winter for unscreened coal. The product is shipped west and northwest. About 30 men employed.

Wm. Adkins, operates a mine north of Blackbird; shaft 37 feet deep and hoisting done by horse-power; mine supplies local trade.

Mendota Coal Co.—F. B. Ketchum, president, and B. H. Johnson, superintendent. This company owns three large mines in this county, but owing to the small demand for coal one of the mines was closed down and only two were operated during the past year. Both mines are located at Mendota, and have shipping connection with the C. B. & K. C. R. R. The mines are working the same vein of coal, which will average about 33 inches in thickness, separated by a clay band two inches thick running regular through the coal, which is underlaid by a fireclay mining and directly overlaid by a strong black slate about a foot thick, and next to the slate lies the cap rock from 2 to 6 feet in thickness, which renders this seam well adapted for the long-wall or room and pillar methods of mining, both of which are in use here. In certain parts of the mines where the room and pillar method is employed, the rooms are turned double and carried 40 feet wide, with a wheel road on each side and two men in a room; the air goes in on one road around the face of the room and out the other, which is a satisfactory way of ventilating. The coal is worked by undermining, cutting the sides and wedging it down or what is called pick work, the only practical way of mining coal. The mines are safe, clean, well ventilated and practically operated; following is a description of both mines as found at dates of inspections:

Mine No. 1.—E. C. Smith, foreman. This is a drift opening, and the coal is brought out by machinery, the tail rope system being in use and which extends a mile into the mine. It is ventilated by two furnaces, one located on the north and the other on the south side of the east entry. The mine is worked in two separate departments, and may be termed two mines from the same opening. I made two inspections of this mine last year. First inspection was made on the 12th of December, and it was found in a very fair condition with the ventilation satisfactory. A new air-shaft had been sunk since my former visit, which was used as a down-cast, thus the miners were getting the air fresh direct from this shaft. I made another inspection on the 20th of March, finding all the work confined to drawing pillars; in the very near future the mine will be abandoned.

Mine No. 2.—Martin Coleman, foreman. This mine is located about two miles east of the Mendota station. It is a shaft 63 feet deep, and equipped with first-class machinery for hoisting. The mine is ventilated by a furnace at present, but before this report comes before the eyes of its readers a ventilating fan will be substituted for it. Two inspections were made, the first one on the 11th of December, and the mine found in very good condition with the ventilation up to the requirements of the law, and fairly distributed around the workings. A new heater had been driven from the east entry off of the north, to connect with the straight east, which shortens the route of the ventilative current about 1000 feet, making it stronger and fresher. I visited the mine and made another inspection on the 20th of March, and found it in good condition, with the requirements of the law observed. This mine is worked on the room and pillar plan; entries are driven double with cross cuts every fifty feet. Doorways and airways are high, wide, clean, and kept in good condition; 80 cents per ton is paid for mining in winter, and 70 cents in summer for screened coal. About 125 men employed.

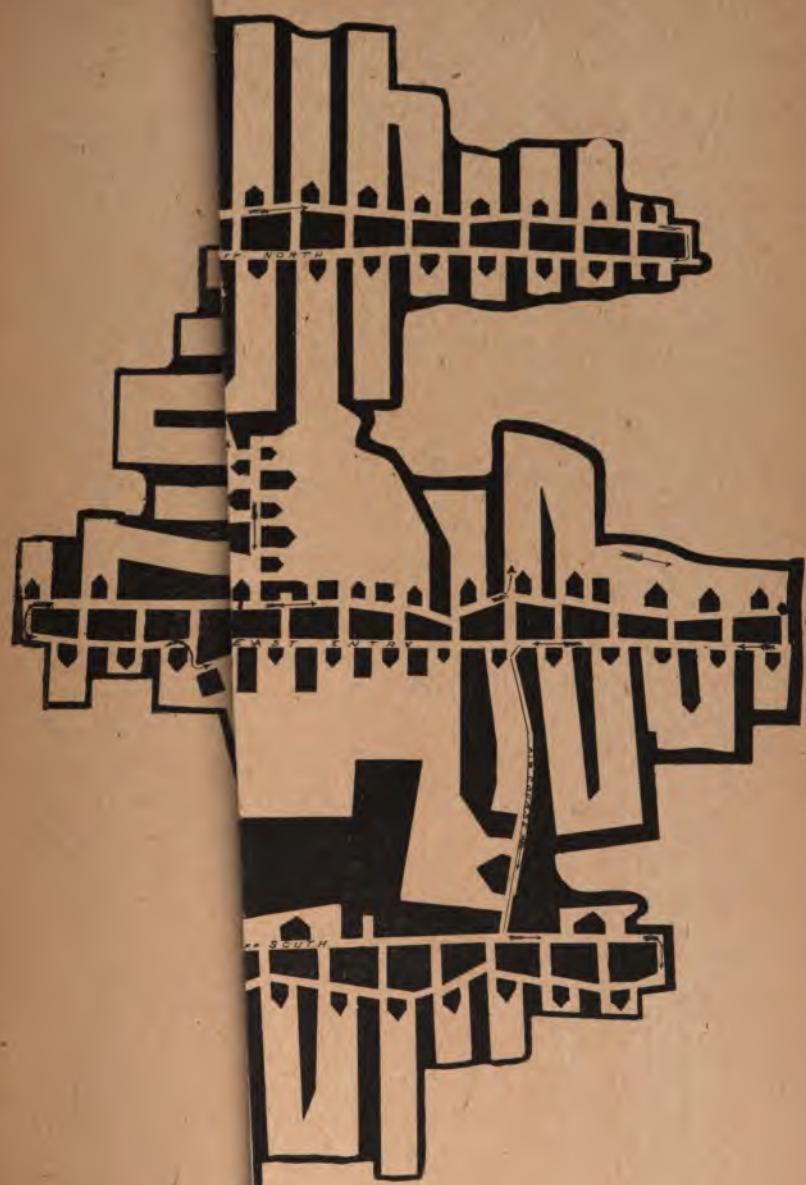
John Leck operates a mine in close proximity to the mines of the Mendota Co.

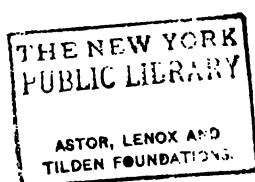
PEARL CITY POSTOFFICE (IOWA).

Rodgers Bros. Coal Co.—These parties are operating a mine near Pearl City, close to the Iowa line. The coal is taken away from the mine in wagons, loaded on cars at Pearl City and shipped over the Council Bluffs and Kansas City railroad. It is a drift opening, and coal is worked on the room and pillar plan; 5 men employed.

North Missouri Black Coal Co.—Mine located near the State line; coal 33 inches thick and worked on the room and pillar method. It is

1145





taken away from the mine in wagons, loaded on cars at the Pearl City switch and shipped to market over the Council Bluffs and Kansas City railroad; 8 men employed.

UNIONVILLE POSTOFFICE.

Emporia Coal Co.—Geo. Evans, superintendent. Shaft 150 feet deep and equipped with first-class machinery for hoisting; shipping connection with the Council Bluffs & Kansas City railroad by a switch. Formerly the product was hoisted by horse-power, but since my last inspection the company has erected a steam plant, built a new pit head, put in new cages, new guides and pit cars, which has greatly increased the capacity of the mine. The engine is connected to a 5-foot drum, with 10 and 12-inch cylinders. The pit head, weigh and tipple houses are well constructed with every convenience for the handling of coal; two new hoisting ropes have also been furnished. I inspected the mine on the 9th of December and found it in good condition. The ventilation, which is produced by a furnace, was found above the requirements of the law. On the 23rd of March I made another inspection and found the mine well ventilated and in good condition, with all safety appliances in good repair. Coal 32 inches thick and worked on the room and pillar double-entry plan; about 50 men employed. The roadways are high, wide, dry, clean and the mine practically operated. The product is shipped west and northwest.

There are several other mines operated on a small scale to supply home trade in the surrounding of Unionville. The name of operators and output of the mines with other imformation will be found in the statistical table of this county.

RALLS COUNTY.

Production 9644 tons.

PERRY POSTOFFICE.

Ralls County Coal Co.—Mine located one mile north of Perry, and connected with the St. Louis & Hannibal railroad. Shaft 40 feet deep; product hoisted by horse-power; ventilation is furnished by a furnace, giving very fair results; the coal is about 24 inches thick and worked on the long-wall plan; it is underlaid by a soft fire-clay and easily mined. The roof overlying the coal is of the nature of a black slate: soft and friable; stands better, however, under the long-wall than the room and pillar system of mining. Since my last visit new work has been opened out on the opposite side of the shaft, the roof is better here than on the other side, with the result that the mine is more suc-

cessfully operated. The coal is of good quality, commands a good price, and finds a ready market after once being tried; about 25 men employed; coal shipped and consumed at Hannibal.

Standard Coal Co.—Mine located north of Perry; drift opening; ventilated by a furnace, and worked on the long-wall plan; coal 24 inches thick and overlaid with good roof; the output of this mine is limited to the local trade; coal consumed at Perry and vicinity.

RANDOLPH COUNTY.

Production, 230,194 tons.

The coal measure formation underlies nearly all of Randolph county. The land lying between the Grand divide on the east and the middle fork of the Chariton river on the west and the county lines on the north and south is nearly all underlaid by a 4-foot vein of coal with the exception of an occasional water-trough or gap; comprising an area of about 150,000 acres of workable coal land. The coal varies in depth from the surface to 200 feet below it. The coal formation is classed as the lower coal measure, though the area exposed is comparatively limited. Its economic importance far exceeds that of the succeeding divisions, since it is here that the most productive coal beds occur.

There are two other veins of coal above which are 10 inches and 18 inches in thickness respectively, and these latter veins underlie almost the entire county, but cannot be profitably worked so long as a 4-foot seam is so convenient. For the year ending June 30, 1896, this county produced 230,194 tons of coal, which was sold at the mines for \$1.10 per ton, or a total valuation of \$255,626. The above is the product of 30 mines, employing 812 men and boys, including miners and other employes in and about the mines. For the detailed information relating to the respective mines see table No. 6. And for the location and condition of the same see the remarks following:

ELLIOTT POSTOFFICE.

Elliott Coal Co.—J. C. Flemmy, superintendent; James Davis, foreman; mine located at Elliott, which is a mining camp situated about 5 miles south of Moberly, with shipping connection over the M. K. & T. R. R. Shaft 145 feet deep and equipped with good machinery for hoisting.

The ventilation was formerly furnished by a double "Murphy Champion" fan and gave satisfaction while in good repair, but having been used for a great number of years it got out of repair and ineffective; it is now replaced by a new fan. The new fan was made by

The Duncan Foundry and Machine Works of Alton, Ill. It is 12 feet diameter, with 8 blades 36x36 inches square, and worked by an engine coupled direct to the fan shaft. It was making 56 revolutions per minute at date of last inspection and exhausting from the mine 25,680 cubic feet of air in same time. The test was made on the return air current at bottom of up-cast. Three inspections were made of this mine last year. First inspection was made on the 26th of August, at which time I found new work had been opened on the southeast side, and more men put to work on the north side; found the ventilation good all over the mine with few exceptions, and where the air was weakest preparations were being made to better it. February 5 I made another inspection and found the ventilation satisfactory at all points and the mine in good condition in every other respect. On the 2d of June I made another inspection and found the ventilation better than on any former inspection. I also found that the north entry had been fully secured by timbers, as requested on a previous visit. It is my pleasure to state that the general conditions of this mine were found better on my last visit than on any previous visit. The entries were high, wide and clean, and the airways high and roomy, with a strong current of fresh air circulating in every part of the mine. This mine gives employment to 175 men and is a great factor in the coal productions of this county. Coal 4 feet thick and worked on the long-wall plan. Mining is paid for at the rate of 75 cents per ton. The coal is nearly all consumed by the railroad company.

HIGBEE POSTOFFICE.

Higbee Coal and Mining Co.—Wm. Walton, superintendent, and L. Hyde, foreman. Mine located west of Higbee and connected with the Chicago & Alton railroad. Shaft 170 feet deep and operated by first-class machinery for hoisting. The mine is ventilated by a 10-foot fan and the air-current divided at the foot of the down-cast to the north and south entries. Three inspections have been made during the year. First inspection was made November 7th, when the fan was found to be running at a speed of 91 revolutions per minute and moving 10,076 cubic feet of air around the workings in same length of mine. The mine was found in very fair condition.

Second inspection was made March 14, when the ventilation was found up to the requirements of the law, except, at points where a squeeze had taken place, and the roof had fallen at the face, thus cutting off the ventilation, as is often the case where the long-wall method is used in soft roof. I visited the mine again on the 2nd of June, and made another inspection; the fan at this date was making 88 rev-

lutions per minute, and was removing enough air to properly ventilate the mine; yet, as on previous inspections deficiency was found at some points, owing to unavoidable obstruction in the route of the ventilative current as it traveled around the mine. Considerable new work has been opened out on the north side during the last year, and a large portion of the air-ways on that side need cleaning and timbering. Coal from $3\frac{1}{2}$ to 4 feet in thickness, and worked on the long-wall plan. About 80 men employed. The roof overlying the coal varies in the character of its formation from that of slate to sandstone and soap-stone; it is very soft and of a friable nature and is not a desirable roof for the long-wall system of mining, as it requires too much care and expense to properly timber and keep the roof secure. The coal is shipped to points west, over the Chicago & Alton R. R. The railroad company, however, consumes a large amount of the product in coaling its engines at the mine; 10 chutes having been erected for that purpose.

Interstate Coal Co.—Wm. Walton, superintendent, and Thos. Bain, foreman. Mine located $1\frac{1}{2}$ miles south of Higbee, with shifting connection over the M., K. & T. R. R. Shaft 110 feet deep, equipped with first-class machinery for hoisting.

The mine is ventilated by a 12-foot fan, and a large volume of air carried to circulate. I inspected the mine on the 24th of August, the fan at this date was making 80 revolutions per minute, and was moving 9730 cubic feet of air around the workings in same time. This volume was divided to the north and south entries, the current to the south side was conducted over an air-crossing and united with the current from the north side at the face of the east entry, from which point it returned to the upcast; 40 men at work at this date. Another inspection was made on the 25th of February, and the ventilation found satisfactory, and the mine in good condition.

June 5th, I made another inspection, the fan at this date was making 77 revolutions per minute, and 10,370 cubic feet of air was found passing in the mine in same length of time; which was fairly distributed around the workings.

The Coal is about $3\frac{1}{2}$ feet thick, and worked on the long-wall plan; roadways are high, dry and clean, and all parts of the mine worked at present found in excellent condition. The product is carried to market over the M., K. & T. R. R., and is consumed at local points and towns along the line of the same. From 50 to 60 men employed.

HUNTSVILLE POSTOFFICE.

John Breckenrige.—Mine located at Huntsville and known as No. 3½; shipping connection with the Wabash railroad. The shaft is 65 feet deep and equipped with machinery for hoisting. The ventilation is produced by a 12-foot fan, and a strong current of air found traveling on the entries, but the air-courses are too small and obstructed to admit a sufficient volume of air to ventilate the mine properly, although Mr. Jacks, the superintendent, is doing all he can to furnish the required amount of air. I fear too much economy is practiced for the good of both miner and operator; in fact, the operator is the greater sufferer as far as dollars and cents are concerned from an unwise economy; but the miner suffers every hour of the day while at work by surrendering energy and health to the impurities of the air, which feeds upon his life as he inhales it. All the entries are driven wide; in fact, they are only entries in name, for they are as wide as rooms and worked the same, and consequently are often caving in and shutting off the ventilation. The mine is also very hot, the heat being caused by spontaneous combustion in the refuse of the mine. I made several inspections during last year and found some improvement had been made in the ventilation. A new air crossing had been built and the ventilative current was split into two currents, each current ventilating a separate portion of the mine and making the air stronger and fresher in the working places. On my next inspection I found another improvement had been made; the ventilative current was found traveling inward on the main south entry to its terminus and then split to the east and west. In that way the miners were getting the air first and fresh from the intake. This was the most satisfactory inspection to me of any yet made. The mine is old and out of repair, entries are low and narrow and the mine in general in very bad condition. About 50 men employed; coal about 4 feet in thickness, worked on the room and pillar plan. Mining is paid for at the rate of 50 cents per ton for unscreened coal. The product is shipped over the Wabash railroad.

Mine No. 1½.—Mine located two miles east of Huntsville. Shipping connection with the Wabash R. R. Shaft 100 feet deep; hoisting by steam-power. This mine was formerly operated by John Breckenridge, but sold to Hedrick & Moore, of St. Louis, who are operating the mine at present. Very little work was done here during the past year. I made several trips to the mine, but failed to find it in operation at any one of my visits; hence, no inspections were made.

Huntsville Coal Co.—Formerly known as the Caffery-Baker Coal Co., H. McHugh, superintendent. This company operates two mines

west of Huntsville, only one of which produced coal the past year; the other mine has been in faulty coal for over a year, and has not produced marketable coal. The mine which has been worked is known as No. 25, it has been operated only a part of the time, for early this year the company assigned; the mine was closed for months, and the miners lost about 40 days' wages in the transaction. I made an inspection of No. 25 on the 21st of November, and found the ventilation very fair and the mine in good condition. Having received complaints from some of the miners to the effect that rooms were turned ahead of cross cuts in several of the entries, I made another visit on the 2nd of January and found that the charges were true. I stopped further work in the rooms until the cross-cuts were made. The company was instructed not to violate this section of the law again. On my next inspection of the mines around Huntsville, found this mine closed. This mine was ventilated by a furnace, and worked on the room and pillar plan. The mine has been very impractically operated, there is no system adhered to, as rooms are turned off rooms, and entries are turned off rooms, and if its superintendent knew anything about managing the underground workings of a mine he has not shown it in this mine. Coal from 3 to 4 feet in thickness; 50 men employed, and 50 cents per ton paid for mining unscreened coal.

Emanuel Edwards operates a mine near Huntsville to supply the home consumption.

J. N. Stewart.—Mine located at Huntsville and operated in fall and winter to supply local trade.

Mitchell & Sandison.—Mine located at Huntsville; drift opening; ventilated by a furnace, and worked on the room and pillar plan. This is the same seam of coal as that worked at other mines in this vicinity. The coal is used to supply local trade; but some, however, is shipped to points along the line of the Wabash railroad.

James Robinson is operating a mine at Huntsville near the gas works; drift opening; worked on the room and pillar plan, and ventilated by a furnace. Thickness of coal and price paid for mining the same as that of other mines in the neighborhood. Coal is taken away from the mine in wagons and consumed at Huntsville and vicinity.

Mike Streiff.—Mine located at Huntsville; drift opening; ventilated by a furnace, and worked on the room and pillar plan. Coal 4 feet thick and consumed in the vicinity.

MOBERLY POSTOFFICE.

Cronan & Hogan Coal Co.—Mine located northwest of Moberly; shaft 105 feet deep and horse-power used for hoisting; ventilation is produced by a furnace; coal 4 feet thick and worked on the room and pillar method. The product is taken away from the mine in wagons and consumed at Moberly and its surroundings; 8 men employed.

Eagle Coal Co.—H. R. Bisbee, manager; mine located two miles west of Moberly; shaft 125 feet deep and operated by steam-power. Ventilation is secured by the aid of a furnace, and the mine fairly well ventilated. Coal varies from 3 to 4 feet in thickness and worked on the room and pillar plan. This mine, while located on the side of the Wabash railroad, has no shipping connection with it, and its output is limited to the local demand. From 10 to 15 men employed.

Joseph O'Toole operates a mine northwest of Moberly; drift opening; ventilated by a small furnace and worked on the room and pillar plan to supply home trade.

Graves & Brone (Col.) operate the old Hedrick mine; drift opening; thickness of coal and mode of working the same as other mines in the locality. Coal consumed at Moberly and surrounding country.

Harry Ward.—Mine located two miles northeast of Moberly. Shaft 90 feet deep; horse-power for hoisting. Ventilation is secured by a furnace, and mine worked on the room and pillar plan. Coal about 4 feet thick. From 6 to 8 men employed in fall and winter to supply home consumption.

William Brennan operates a mine in the hollow, about three miles north of Moberly. Coal consumed in the surrounding vicinity.

J. B. Williams & Son.—Mine located about a mile from Moberly. Shaft 90 feet deep; horse-power used for hoisting. Thickness of coal and mode of working and price paid for mining is the same as that of other mines in the vicinity. About 4 men employed. The coal is consumed in Moberly and vicinity.

Wm. McKernnan operates a mine in the hollow north of Moberly. Drift opening; supplying home trade.

Jones & Davis Coal Co.—Mine located 3 miles west of Moberly, and connected with the Wabash railroad. Shaft 96 feet deep, and equipped with first-class machinery for hoisting. Ventilation is furnished at present by a furnace, but the company contemplates putting up a fan in the near future. This is a new mine sunk and opened out in the summer and fall of the year of 1895. The pit-head, tipple house and engine houses are all new and well constructed. Machinery,

cages, ropes, and pit-cars are also all new. The engines were made by Ellison & Sons Iron Works of St. Louis, they have a pair of cylinders 10x16 inches, coupled direct to a 4-foot drum and working on third motion. An escapement shaft has been sunk and partitioned off in two compartments, one of which is used for the passage of air, and a stairway has been erected in the other for escape. First visit to this mine was made November 22nd, as the entries had only been started there was not enough of the mine open to inspect; made a careful investigation of the machinery and safety appliances. April 3rd I visited the mine again. The entries had been driven the four points of the compass and a permanent system of ventilation had been adopted but the mine as yet is not extensively opened and very few doors had been set. Coal 4 feet thick and worked on the room and pillar plan. From 30 to 40 men employed, and 70 cents per ton is paid for mining clean coal. The product is shipped west and consumed at local towns along the line of the Wabash railroad. G. Morris, foreman.

D. T. Bradley, is operating a mine on his own land about 4½ miles southeast of Moberly. The shaft is 60 feet deep and operated by horse-power; mine is ventilated by a furnace, and worked on the room and pillar plan; coal about 3½ feet thick and the same seam as that worked in other parts of the county. The coal is hauled away from the mines in wagons and consumed at the Moberly brick-works; about 10 men employed and 70 cents per ton paid for mining.

RENICK POSTOFFICE.

Brown and Welsly are operating a mine east of Renick to supply home demand.

John L. Morris is operating a mine near Renick to supply home consumption.

There are several other small mines in this county located at Jacksonville, Rolling Home, Thomas Hill and Yates, which I have not had the time to visit. But the product of the mines will be found in the statistical table of this county. The mines are operated only in winter and the product consumed in the immediate vicinities.

RAY COUNTY.

Production 149,095 tons.

Ray county is one of the large coal producing counties of the State, her principal mines are located at Camden, Fleming and Richmond. Mining, however, is being carried on in a limited manner to supply local trade at several other places in the county.

The Wabash and Santa Fe railways, passing through the center of the coal field with their terminus north and west, furnish good shipping facilities for the product. While the principal coal seam mined within the borders of Ray county is small in point of thickness as compared with some of the coal seams in other parts of the State, yet the quality of the coal, the nature of its roof and mining, the economic mode of working it, and its close proximity to the Kansas City and St. Joe markets, gives the mine operators the advantage over the operators in other parts of the State where thicker seams of coal are mined. Eighteen inches is about the general thickness of the coal seam at Camden, Fleming and Orrick, and all mines along the bank of the Missouri river; but in the vicinity of Richmond, the vein is about 6 inches thicker. During the past year there were 34 mines in operation, which produced 149,093 tons of coal, which was sold at \$1.39 per ton at the mines, or for a total amounting to \$207,704. In producing this amount of coal 920 men and boys were employed in and about the mines in winter, and 349 in summer. All mines operated this year are worked on the long-wall method. Two inspections were made this year of all mines in this county. Following is a description of each mine, together with a statement as to their location, and the condition in which they were found at dates of inspection :

CAMDEN POSTOFFICE.

Lockwood and Lusk Coal Co.—Mine located two miles east of Camden; shipping connection had with the Santa Fe railroad by a switch; shaft 43 feet deep, equipped by machinery for hoisting; coal 18 inches thick, worked on the long-wall plan and using the moveable face track; ventilation is secured by a furnace and giving very fair results; 30 men employed; coal shipped to Kansas City and points west.

Mosby Bros.—Mine located at Lower Camden; drift opening; thickness of coal, mode of working and price paid for mining the same as that of other mines in this county. Coal used to supply local trade; some, however, is shipped to points along the Wabash railroad.

John Frazier is operating a drift mine at Camden and supplying the home trade.

FLEMING POSTOFFICE.

Kansas and Texas Coal Co.—B. F. Hobart, president, and Ed Vale, superintendent. Mine located at Fleming and has shipping connection with the Wabash railroad. Shaft 70 feet deep and equipped with good machinery for hoisting.

The mine is ventilated by a 12-foot fan and giving good results. The ventilative current comes down the main shaft and travels over

the north entry to its terminus, where it divides to the east and west sides, passing the face of all the working places on its route to the fan shaft. I made the first inspection of this mine on the 16th of November and found the ventilation above the demand made by the law, the mine in good condition and the airways clean and roomy. Two new hoisting ropes had been put in since my previous visit, to replace the old ones condemned; two new pulley wheels and new guides had also been added.

I made my second inspection on the 29th of April and found the mine in good condition; the ventilation was found above the requirements of the law, and the safety appliances in good order. Thickness of coal, system of working and price paid for mining the same as that of all other mines in Ray county. Coal is shipped to points west, but the Wabash railroad consumes a very large amount of the output. There are 10 chutes erected at the mine with which to coal engines. At dates of inspection 90 and 70 men were employed respectively.

GEORGEVILLE POSTOFFICE.

W. Sater has been operating a mine at Georgeville for a number of years, but we are informed that he has sold out his interest in the mine to James Linville and Charles Johnson, who operate it at present. The shaft is 125 feet deep and hoisting by horse-power. Coal 22 inches thick and worked on the long-wall plan; supplying local demand.

HARDIN POSTOFFICE.

There are several parties operating mines for the home supply in the vicinity of Hardin, Lakeview and Norborne.

Nearly all the mines are entered by drifts and ventilated by small furnaces. The thickness of the coal, mode of working and price paid for mining is the same as that paid at other mines in this county. The names of all the operators, output of the mines, with other information will be found in the statistical table of Ray county.

ORRICK POSTOFFICE.

Bissell Coal Co.—John Bissell, superintendent; mine located at Old Albany, one mile north of Orrick, and has shipping connections with the Wabash railroad. Shaft 64 feet deep and operated with steam-power for hoisting and draining; ventilation furnished by a furnace, which was giving good results. Coal 18 inches thick and worked on the long-wall plan; 20 men employed. Coal hauled on a tram-road to railroad switch, loaded on cars and shipped over Wabash railroad westward.

RICHMOND POSTOFFICE.

Black Diamond Coal Co.—C. Anderson, Supt.; mine located at Richmond. Shaft 80 feet deep, and hoisting by horse-power. Coal 22 inches thick; worked on the long-wall plan, and ventilated by a furnace; the output of the mine is limited to the supply of the local trade. About 6 men employed.

Old Black Diamond Mine is located at Richmond, and the New Black Diamond Mine has an underground connection with the latter; 4 men employed, and the coal consumed at Richmond and surroundings.

Dickson & Son are operating a mine near Richmond to supply local trade.

Dickson & Stewart are operating the old Milligan mine, about a mile north of Richmond. It is a shaft 25 feet deep, using horse-power for hoisting; working on the long-wall system, and ventilated by a furnace. Coal consumed at Richmond.

Hyson & Humble operate the City mine, which is located in the City one block from the court-house. Shaft 80 feet deep, and operated by horse-power. Coal 24 inches thick; worked on the long-wall plan, and ventilated by a furnace. Supply local trade.

John W. McCort is now operating the old Mosby mine just east of the corporate limits of Richmond; shaft 60 feet deep and hoisting done by horse-power. Coal 22 inches thick and worked on the long-wall plan. Ventilation is secured by a furnace. Output of the mine is limited to the local demand, and the product consumed at Richmond.

Josiah Whiteman is now operating the Randall mine. This is a shaft 90 feet deep, hoisting by horse-power and ventilated by a furnace. Thickness of coal, mode of working and price paid for mining the same as that of other mines in this county. Coal used at Richmond.

The James & Murry mine is now operated by John C. Hamahany. This mine is located two miles southeast of Richmond. Shaft 65 feet deep and operated by horse-power. Same seam of coal is worked here as at other mines. It is consumed in the surrounding country.

Pence & Calnen Coal Co.—Mine located one-half mile south of Richmond and connected by a switch with the St. Joe branch of the Santa Fe railroad. Shaft 94 feet deep and hoisting done by horse-power. Ventilation is furnished by a furnace, which was giving good results at date of inspection. An escapement shaft has been sunk during the year and every other requirement of the law complied with. Coal 24 inches thick and worked on the long-wall plan; product shipped

to points west and north over the Santa Fe railroad; from 30 to 40 men employed.

Richmond & Camden Coal Co.—J. S. Hughes, president; John Gibson, manager and superintendent. This company owns and is operating 7 mines in this county, from which a large amount of coal is produced each year, and employment furnished to a large number of men. The mines are all worked on the long-wall plan, well ventilated and drained, with good, high road-ways, and the general condition of each is good. The thickness of the coal at the Camden mines is about 18 inches; it is overlaid with 10 inches of draw-slate, which comes down with the coal and is used to build walls to secure the roof, as very little timber is used in these mines.

The coal in the surroundings of Richmond will average about 24 inches in thickness; it is overlaid with an excellent rock roof, which greatly adds to the economic working in the long-wall method of mining. A moveable face track is used at all the mines in this county, which is a great convenience to the miner in loading coal, as it saves the extra labor of rehandling it. Following is a description of each mine:

Mines Nos. 1 and 2 are located one mile west Camden, each connected with the Santa Fe and Wabash railways. Both shafts are equipped with good machinery for hoisting. An underground traveling way connects the two mines, so that either one may act as escape-mine for the other in case of accident. Both mines work the same face of coal, ventilated by the same currents, and for all practical purposes might be termed one mine with two openings. Both mines are ventilated by the aid of furnaces, which give satisfaction. I made two inspections of the mines last year, November 18th and April 29th, and found the ventilation above the requirements of the law, and the mines in good condition. No. 1 has 10 chutes for coaling engines. The hoisting ropes at No. 1 was found in poor condition and condemned, and the company instructed to put on new ropes. About 100 men employed at both mines.

Mines 3, 4, 5 are located south of Richmond, and have shipping connections with the St. Joe branch of the Santa Fe railroad. These three mines are connected by an underground roadway, and are all working on the same coal face which is over a mile long. All three mines are ventilated by the same fan which is set on top of an air-shaft near mine No. 5, and for all practical purposes the three may be called one mine with three openings.

Mine No. 3 is a shaft 55 feet deep equipped with very fair machinery for hoisting. The ventilative current travels along the face

of the workings. I made the first inspection of this mine last year on the 20th of November, and found the ventilation up to the demands of the law and the mine in very fair condition. May 1 I made another inspection and found the requirements of the law fully observed. This is considered a wet mine, as considerable water is found at the face of the workings, which has to be drained by a pump.

Mine No. 4 is located about a fourth of a mile north of No. 3. This is a shaft 65 feet deep and operated by good machinery; mine inspected on the 20th of November and found in good condition and well ventilated. On my second visit, May 6th, I found it closed for the summer; hence, no inspection was made.

Mine No. 5 has also a steam-plant; shaft 75 feet deep. The same description of the underground working applies here as that given for Nos. 3 and 4, for the conditions connected with the three mines are the same. The fan is 12 feet in diameter, set on top of air shaft near this plant, and running at a speed of about 80 revolutions per minute. The air current is divided to the east and west sides, and after traversing the entire working face of the three mines, it is forced out at the hoisting shafts. The mines having been in operation for a great number of years, are driven in a long distance from the bottom of the several shafts, and owing to shallow coverings found in passing under ravines, considerable water has seeped into all of the mines; the company are now at great expense taking it out. From 200 to 300 men are employed.

Mine No. 9 is located west of Richmond, and connected with the St. Joe branch of the Santa Fe R. R. Shaft 100 feet deep, and the only mine operated by this company where hoisting is done by horse-power. The mine is ventilated by a furnace which was giving good results at dates of inspection, November 18, and April 28. At date of first inspection, I found the ventilation satisfactory, the mine in good condition and 40 men employed.

Mine No. 12 is located 1½ west of Richmond and has shipping connection with the St. Joe branch of the Santa Fe railroad. The shaft is 120 feet deep and equipped with good machinery for hoisting. Ventilation is furnished by a furnace and the mine is well ventilated. The coal runs low, faulty and irregular, which is very unfortunate for the operator and miner alike, for the mine is well equipped and neither money or labor was spared by the company to make it the best mine in the county. Entries are being driven to test the coal, and I hope the thickness will soon come up to the standard. The coal from the mines of this company is consumed in Missouri, Nebraska and Minnesota. The company employs about 400 men.

Hubbell, Hyatt & Hubbell Coal Co.—Mine is known as No. 7. It is located within the city limits of Richmond and has shipping connection with the St. Joe branch of the Santa Fe railroad. Shaft 115 feet deep and operated by steam-power and ventilated by a furnace, which was giving very good results at dates of inspection, November the 18th and the 27th of April. On my first inspection found that work in the east part of the mine had been temporarily suspended and the work confined to the north and west entries, where about 40 men were at work. The airways had been enlarged since my previous inspection and a larger volume of air was found passing. This mine has been and is very extensively worked, the air has a long distance to travel around the face of the workings, and as the mine is worked on the long-wall method the roof is constantly settling and lessening the area of the airways, which results in retarding the free flow of air and developing one of the greatest difficulties met with in mine ventilation.

The furnace at this mine (like that at several other mines in this county) is located at the bottom of the hoisting shaft, exhausting through an air chamber partitioned off from one end of main shaft. The size of the air chamber is about 2x6, or in all 12 feet area, which is entirely too small. For instance, here is a mine with a capacity of 300 tons of coal per day, and has space enough open to put 200 men at work, and yet an air chamber of only 12 feet area is supposed to do work that double the area would be made necessary to accomplish. The furnace is also too small to produce that quantity of air required by law when the mine is running anything like its full capacity. Thickness of coal, mode of working and price paid for mining same as that of other mines in this country. Coal shipped to St. Joe and points north.

Fisher & Hubbell Coal Co.—Mine located one mile west of Richmond and connected with the St. Joe branch of the Santa Fe R. R. by a spur track. Shaft 110 feet deep and hoisting by horse-power. The mine is ventilated by a furnace which was giving good results at dates of inspection. An underground connection is being made and kept open between this mine and No. 11 as an avenue of escape for the miners of either of the mines in case of fire or any other accident to the hoisting shaft. Coal about 24 inches thick and worked on the long-wall plan. Coal is shipped to St. Joe and points north. About 30 men employed.

Pickering Coal Co.—Mine located about a mile west of Richmond, and has shipping connection by a spur track with the St. Joe branch of the Santa Fe railroad. The shaft is 110 feet deep, operated by machinery and ventilated by a furnace. The mine is well ventilated and

practically operated, the ventilative current is circulated around the workings in two divisions and supplies plenty of fresh air. Thickness of coal, mode of working and price paid for mining is the same here as in other mines in the county. From 30 to 40 men employed.

Mrs. Mary Wilson mine, known as No. 8.—This mine is located at Richmond, and connected with the St. Joe branch of the Santa Fe railroad. It has a shaft operated by machinery and ventilated by a furnace. The ventilation at this mine is not as good as desired, the mine having been in litigation for several years, was badly neglected. The upheaving of the bottom and the settling of the roof made the airways so small that a sufficient volume of air to ventilate the mine properly cannot pass; but the present management has promised to remedy the evil. The coal at this mine like that of the surrounding mines is about 24 inches thick, and worked on the long-wall plan; from 20 to 25 men employed. The product is shipped to St. Joe and points north and west.

A. F. Rankin.—Mine located one mile northwest of the R. & L. Junction, and connected with the St. Joe branch of the Santa Fe R. R. This is a drift opening, and mine ventilated by a furnace with good results. The thickness of coal, mode of working and price paid for mining the same as that of all other mines in the county. About 30 men employed and the product is shipped to Kansas City & St. Joe.

SWANWICK POSTOFFICE.

Williams Coal Co.—J. R. Williams, superintendent; mine located at Swanwick, and has shipping connection with the St. Joe branch of the Santa Fe railroad. On my first inspection of this mine last year, I found that a new shaft had been sunk about $\frac{1}{4}$ of a mile north of the old one, and that an underground connection had been made between the two shafts. The hoisting apparatus was moved from the old mine and rebuilt at the new one. This is now a good mine and well ventilated. The coal is not so thick here as at the Richmond mines, it varies from 16 to 22 inches in thickness and is worked on the long-wall plan. About 30 men employed; coal shipped north and consumed at St. Joe and at local points along the line.

ST. CLAIR COUNTY.

Production, 4058 tons.

There are quite a number of mines in operation in different parts of St. Clair county, but operated only in a small way to supply home consumption.

APPLETON CITY POSTOFFICE.

All the mines in the vicinity of Appleton City are operated only in the fall and winter, and the output of all limited to the local demand; most of the coal is obtained by shipping.

IUKA SPRINGS POSTOFFICE.

The following parties are operating mines at Iuka Springs: M. Caskins, A. J. Davis, J. D. Short, Frank Hines, M. Richmond and Fred Manta. The output of the mines, thickness of coal, with other information, will be found in the statistical table of this county.

LOWRY CITY POSTOFFICE.

The Red Rock mine has been operated by M. Chambers during the past year; it is located about 5 miles south of Lowry City; it is a drift opening and ventilated by a furnace; coal 28 inches thick and worked on the room and pillar plan; it is hauled from the mine in wagons, loaded on cars at Red Rock switch and shipped over the K. C., Ft. S. & M. R. R.; from 8 to 10 men employed.

E. D. Jones of Kansas City has bought about 600 acres of land in the vicinity of Lowry City with the intention of opening up a number of mines. The land is nearly all underlaid with coal of about 3 feet in thickness, but the covering is so shallow at several points on the land as to make underground mining impractical at such points, and the coal must be obtained by stripping. There are mines operated at Johnson City, Taberville, Oceola and Vista and at other places throughout the county during the fall and winter months.

SALINE COUNTY.

Production, 432 tons.

ELMWOOD POSTOFFICE.

John Paris operates a mine in the neighborhood of Elmwood to supply local trade. Coal about 18 inches, worked on the long-wall plan and consumed in the vicinity.

MIAMI POSTOFFICE.

Mark Whitaker operates a mine near Miami. It is entered by a slope; operated on the long-wall plan and ventilated by natural current. Coal about 18 inches thick and when mined is hauled away in wagons and consumed in the surrounding country.

MT. LEONARD POSTOFFICE.

Henry Taylor has a mine on his land which is operated by Jos. McQuillan. Shaft 52 feet deep and operated by horse-power. Coal

18 inches thick and worked on the long-wall plan. This is the same seam as that so extensively worked at Corder, Higginsville and throughout Lafayette county. The output of the mine is limited to the local demand.

SWEET SPRINGS POSTOFFICE.

Henry Bowman operates a mine on the Marmaduke land, one mile south of Sweet Springs. Shaft 14 feet deep; hoisting by horse-power. Coal 30 inches thick, worked on the room and pillar plan and ventilated by a furnace. From 6 to 8 men employed. The product is consumed at Sweet Springs.

Thomas Dickson is operating a mine on the land of B. T. Bellamy, three-fourths of a mile east of Sweet Springs. Mine only operated in the fall and winter to supply the home consumption.

B. F. Flynn operates a mine 1½ miles south of Sweet Springs, on the land of John Lahman.

John Highly is operating a mine 4 miles north of Sweet Springs, on the land of Jake Hines. There are several other small local mines operating in this county in the fall and winter to supply winter demand.

BLACKBURN POSTOFFICE.

Blackburn Coal Co.—Mine located south of Blackburn. Shaft 35 feet deep and operated by horse-power. Coal 18 inches thick, worked on the long-wall plan and ventilated by a furnace. Coal consumed at Blackburn and vicinity. From 6 to 10 men employed.

SCHUYLER COUNTY.

Production, 2440 tons.

Schuyler county is underlaid with the coal measure formation, and mining is prosecuted in various sections of the county, but as yet only on a small scale. Two workable veins of coal are found under the surface of a large portion of the county, which has already attracted the attention of coal men; considerable prospecting has been done and thousands of acres of coal land has been bought and leased during the past year. We will not be surprised to find Schuyler county one of the large coal producing counties of the State in the near future.

LANCASTER POSTOFFICE.

Raven Coal Co.—Mine located two miles southwest of Zola. Shaft 39 feet deep; horse-power. It is operated on the room and pillar plan, and ventilated by a small furnace. Coal 46 inches thick. The output of the mine is limited to local trade.

ZOLA POSTOFFICE.

Hardin Taylor operates a mine on the Franklin land to supply local trade.

William Bass is operating a mine southwest of Zola, on the bank of the Chariton river. At first the coal was stripped until the covering went too thick, when he started to drift it.

DEAN POSTOFFICE (IOWA).

A mine is operated close to the State line near Dean, on the land of Ellen Vandyke. And another mine is operated in the same locality, on the Hall land. Both of these mines are operated to supply home trade.

QUEEN CITY POSTOFFICE.

Ira Goldstien operates a mine near Queen City. Shaft 60 feet deep and hoisting by horse-power. Coal 30 inches thick and worked on room and plan. Coal consumed in the vicinity.

VERNON COUNTY.

Production, 303,886 tons.

Vernon county's coal production is as yet in its infancy when considered in connection with its possibilities. Its coal area, embracing a 4-foot vein of coal (among others), extends over a large portion of its territory and will for many years prove to be one of the principal sources of revenue.

During the past year 303,886 tons of coal were mined, which averaged at the mine 90 cents per ton, or an aggregate amount of \$275,180.

In producing this large amount of coal employment was furnished 324 miners in winter and 304 miners during the summer months.

New mines continue to be opened each succeeding year while many old mines are improved and enlarged. The most productive mines at present operated are located near Panama, in the northern part of the county. The Missouri Pacific railway passing through the center of the coal field secures the great bulk of this class of transportation.

Following will be found a brief description of the mines in this county, in connection with a statement as to the condition in which they were found respectively at dates of inspection:

ARTHUR POSTOFFICE.

Arthur Coal Co.—Mine located one mile north of Arthur station; shipping connection with the Missouri Pacific railroad. Owing to the shallowness of the covering over the coal, underground mining has

proven a failure here, and it is now taken out by stripping. The coal is about 6 feet in thickness and removed from the mine in pit cars, hauled over a traim-road and then loaded on cars at a railroad switch on the Missouri Pacific railroad.

BRONAUGH POSTOFFICE.

There is a large amount of coal mined in the neighborhood of Bronaugh in the fall and winter to supply local trade. The coal varies in thickness from 12 to 18 inches; the shallowness of the covering over a small seam makes underground mining impractical and stripping is resorted to. The names of parties operating these mines and the output of same will be found in the statistical table of Vernon county in this report.

MILO POSTOFFICE.

A. D. Lightner, operates a mine near Milo, in Drywood township. Mine only operated during the winter months to supply local trade.

R. D. Rainse is operating a mine in the same locality to supply home demand.

MOUNDVILLE POSTOFFICE.

W. D. Garton is operating the Shaw mine; shaft 35 feet deep; horse-power; worked on the room and pillar plan, and ventilated by a furnace; coal 2 feet thick, and product mined consumed at Moundville.

W. S. Angel operates a mine at Moundville to supply the home demand.

RICH HILL POSTOFFICE.

Central Coal & Coke Co.—John Perry, general manager, and David Mackie, general superintendent. This company owns and is operating two mines in this county, both of which have shipping connection with the Missouri Pacific railroad by switches.

Mine No. 8.—John Mackie, foreman. Mine located one mile south of Panama station. Shaft 168 feet deep, and equipped with first-class machinery for hoisting, draining and ventilating.

This mine was sunk and equipped with a view to its becoming one of the large producers of the State, but unfortunately the shaft was sunk at a point where the coal was not only thin and faulty, but it had a thick rock underlying it, a mining condition which proves expensive to the company, as well as disadvantageous to the miner. The ventilation is furnished by a fan, and the mine is fairly well ventilated. I made three inspections here last year—October 22nd, February 17th and May 11th. On the two first inspections found from 15 to 20 men at work, driving prospecting places ahead, in the attempt to find better

coal, with poor results. On date of last visit, found all the entries had been stopped, work confined to pillar and stumps; the mine will soon be abandoned. All the safety appliances were found in good condition.

Mine No. 9.—John H. Williams, foreman. Mine located one mile south of old No. 7 mine. This is a new mine, shaft was sunk this last spring and commenced shipping coal during the summer. The machinery and pit head, with top building of Mine No. 7 were remodeled and set up here. A fan had been erected and set on top of shaft so as to exhaust through an air chamber partitioned off the side of hoisting shaft; an escapement shaft will be sunk and equipped with a larger fan at once. Very little mining had been done up to date of my visit; hence, no inspection has been made of the inside workings.

Rich Hill Coal and Mining Co.—This company owns and is operating two mines in this county, both of which are under the same management and supervision as the mines of this company in Bates county. In fact, all mines of this company located in this and Bates county are working the same seam of coal and after similar methods.

Mine No. 16.—W. J. Gresham, foreman. Mine located at Panama and connected with the Mo. P. R. R. The mine is entered through a slope, and the product is brought to the surface by steam-power. The ventilation is furnished by a 10-foot fan, and the mine is well supplied with good air. I made 3 inspections of this mine last year. First inspection was made Oct. 23rd, the fan at this date was making 110 revolutions per minute, and was causing 21,190 cubic feet of air to pass around the mine in same time; this volume was circulated in two currents, giving an abundance of fresh air to every part of the mine. I made the second inspection on the 18th of February and found the mine in good condition. May 12th I made another inspection and found the ventilation above the requirements of law and the mine otherwise in good condition. The coal at this mine is faulty, and the roof is very soft and irregular, requiring great care and a large amount of timber to keep it secured. The coal will vary in thickness from 3 to 5 feet; it is worked on the double-entry room and pillar plan. About 60 men employed.

Mine No. 17.—John Daly, foreman. This mine has a shaft 125 feet deep; equipped with first-class machinery. It is ventilated by a 15-foot fan, which was supplying plenty of air in every part of the mine; in fact, there is no better ventilated mine on the American continent today than Mine No. 17. I made three inspections of the mine last year, October 24th, February 18th and May 12, and found it in good condition at each inspection, with the ventilation equal to all demands and the

safety appliances in good order. Coal from 3 to 5 feet thick and worked on the double-entry room and pillar plan. About 80 men employed.

Brown Bros. Coal Co. (or better known as the McCombs mine).—This mine is located east of Panama and has shipping connection by a switch with the Missouri Pacific railroad. Shaft 45 feet deep and operated by steam-power. Ventilation is furnished by a 10-foot fan, and the mine is well ventilated. Three inspections were made of this mine last year; the ventilation was found good at each inspection and the condition of the mine generally was very fair. The mine is worked on the double-entry room and pillar plan. Coal low, irregular and faulty. About 35 men employed. The product is shipped west and north.

Vernon Coal Co.—John Nickols, foreman; mine located east of Panama; it is a drift opening; the coal is hoisted by machinery; ventilation is furnished by a 10-foot fan, which was giving good results at dates of inspections. I made the first inspection of this mine on the 21st of October. The fan at this date was running at a speed of 110 revolutions per minute and was moving 19,320 cubic feet of air around the workings in same length of time. This volume of air circulated in two currents, one current ventilating the west side and returning to the fan over an air crossing, while the other current ventilates the 5th and 6th east entries, where half the men were working. I made another inspection on the 17th of February and found the mine in good condition and well ventilated. Third inspection was made on the 11th of May. Ventilation was found up to the demands of the law and the mine in very fair condition. Coal 4 feet thick and worked on the double entry-room and pillar plan. Coal shipped to market over the Missouri Pacific railroad. About 80 men employed.

WALKER POSTOFFICE.

The following parties are operating mines and taking out coal in the vicinity of Walker station during the fall and winter to supply the home trade: C. B. Crawford, John Blair, Al Gordon, J. D. Wright, Mrs. Margret Burks, Morris Man, Mrs. M. Hamilton, William Pritchard, Joseph Dodson, James Dodson and Conole Davis. All of above are working the same vein of coal, which is about two feet thick. All are strip mines.

TABLE V.—Showing by Counties the Plant, Employes, Tonnage and

Counties.	Kind of opening.		No. mines operated.	Kind of power.		How ventilated.		Mode of working.		Pillar-and-room ..
	Slope ..	Shaft ..		Steam ..	Horse ..	Hand ..	Furnace ..	Fan ..	Long-wall ..	
	Drift ..	Strip-pit ..								
Adair	2	2	4	1	2	1	1	2	1	3
Audrain	1	1	10	8	6	1	4	5	1	3
Barton	2	7	23	2	3	11	12	2	1	15
Bates	9	2	12	28	5	10	1	6	5	16
Boone	4	5	2	1	4	8	7	6	5	12
Caldwell	2	2	2	2	2	2	2	1	1	2
Callaway	2	3	9	1	5	3	6	2	1	9
Carroll	1	2	5	10	3	2	5	2	1	3
Cass	1	1	1	1	1	1	1	1	1	1
Cedar	2	3	8	4	4	5	5	5	1	4
Charlton	1	3	4	1	1	1	1	1	1	1
Clay	1	1	1	1	1	2	1	1	1	1
Cooper	1	2	3	1	1	2	3	3	1	2
Dade	1	6	1	8	4	4	8	1	1	8
Grundy	2	1	2	2	1	1	1	1	1	2
Henry	17	4	8	30	5	16	1	6	11	6
Howard	1	1	1	2	2	1	1	1	1	2
Jackson	1	1	1	1	1	1	1	1	1	1
Johnson	4	4	4	4	4	3	1	1	1	4
Lafayette	30	6	20	56	9	15	32	15	37	4
Linn	6	6	6	2	1	3	1	4	1	6
Livingston	2	2	2	2	2	2	2	1	1	1
Macon	8	2	8	13	7	2	4	4	2	1
Montgomery	3	3	3	1	2	2	2	2	1	2
Nodaway	6	3	9	1	5	2	6	4	4	5
Putnam	4	2	6	12	3	1	8	6	5	12
Ralls	1	2	3	1	1	2	1	2	3	1
Randolph	13	8	8	29	10	9	10	5	19	5
Ray	26	2	6	34	12	14	8	5	25	4
St. Clair	1	5	1	8	1	6	6	1	1	7
Saline	1	1	1	2	1	1	2	1	2	1
Schuyler	2	1	1	4	3	1	3	1	1	4
Vernon	5	2	19	26	7	.....	.....	7	146	7
Totals	167	66	79	60	372	78	112	122	116	165

Value of Product of Missouri Coal Mines for Year Ending June 30, '96.

Powder.	No mules worked..	Employees.						Tons mined in each county	Average price per ton received at mines..	Casualties.	
		Miners.	Other employees.	Total.		Summer.	Winter..			Non-fatal	Fatal.....
No. kegs used.	Cost.....	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..
225	\$316 75	7	5	122	55	10	5	132	60	23,510	\$1 15
33	49 50	3	3	104	57	23	18	127	75	37,611	1 35
1,244	2,486 00	9	7	127	68	44	27	171	95	37,570	1 06
17,572	18,466 70	48	37	481	380	98	59	579	439	37,500	98
369	544 20	6	4	106	51	17	11	123	62	20,428	1 37
.....	.....	2	2	94	74	11	11	105	85	19,780	1 56
.....	.....	4	3	74	30	14	6	88	36	22,182	1 38
1	2 00	.....	.....	13	.....	13	.....	26	.....	2,204	1 80
30	45 00	.....	.....	6	.....	1	.....	7	.....	1,000	1 50
.....	.....	10	7	7	2	17	9	1,863	1 29	2,410	.....
.....	.....	1	1	3	1	4	1	385	2 00	710	.....
.....	1	1	24	24	8	8	32	32	6,500	1 25	8,125
.....	.....	6	4	.....	.....	6	4	750	1 95	1,402	.....
.....	.....	88	15	1	.....	34	15	4,570	1 48	6,780	.....
.....	.....	4	3	108	129	24	24	132	153	41,000	1 55
.....	13	9	263	173	75	53	338	231	78,551	1 37	107,784
.....	1	1	14	6	2	2	16	8	3,220	1 98	6,385
.....	2	2	65	40	10	10	75	50	18,000	1 25	22,500
.....	.....	17	4	2	1	19	5	3,961	1 50	5,930	.....
70	80 50	51	27	1,196	475	193	101	1,889	576	807,286	1 38
.....	.....	10	8	305	242	48	38	353	280	92,022	1 52
.....	.....	7	4	2	2	9	6	1,155	2 00	2,310	.....
14,604	25,541 00	65	55	1,188	929	239	191	1,427	1,120	519,649	98
.....	.....	.....	33	29	6	6	39	35	10,736	1 21	18,021
.....	.....	.....	41	11	3	1	44	12	6,065	2 18	18,271
.....	.....	14	12	340	225	61	47	401	272	85,032	1 17
.....	.....	.....	31	25	3	2	34	27	9,644	1 24	11,925
2,323	4,328 70	41	40	696	612	116	111	812	723	230,194	1 11
.....	31	16	805	294	115	55	920	349	* 149,093	1 39	207,704
10	16 50	.....	21	12	7	1	28	13	4,058	1 49	€,076
.....	.....	.....	4	1	.....	.....	4	1	482	2 14	924
.....	.....	8	17	2	2	.....	19	2	2,440	1 40	3,402
15,173	21,027 25	65	60	324	304	158	104	482	408	303,886	90
51,654	\$72,904 10	380	295	6,676	4,287	1,316	897	7,992	5,184	2,420,147	\$1 13
										\$2,741,711	15 20

TABLE VI—Showing, by counties, kind and number of coal mines of men employed, prices paid and received, total output of coal amount received for the product.

ADAIR

Office number.....	Name of company or mine owner.	Name of operator.	No. of days worked..	Kind of opening	Depth of shaft.....	Kind of power	How ventilated	Diameter of fan.....
								Fuel.....
1	Madden, J. F.....	J. F. Madden.....	100	1	1	Electricity.....	Furnace.....	
2	O. K. Coal Co.....	J. F. Stroup.....	222	1	50	Natural.....	Ram.....	
3	Scott, D. C.....	D. C. Scott.....	100	1	53	Electricity.....	Furnace.....	
4	Stahl Coal Mine.....	H. C. McCahan.....	122	1	3	Electricity.....	Ram.....	
	Totals.....		544	2	10	Electricity.....	Furnace.....	
					2	Electricity.....	Ram.....	
					3	Electricity.....	Furnace.....	
					4	Electricity.....	Ram.....	
					5	Electricity.....	Furnace.....	
					6	Electricity.....	Ram.....	
					7	Electricity.....	Furnace.....	
					8	Electricity.....	Ram.....	

AUDRAIN

1	Atkins, D. J.....	D. J. Atkins.....	106	1	1	2	6	1	1	1	1
2	Davis, C. C.....	Davis, Reynold & Roach.....	265	1	41	4	3	1	1	1	1
3	Detienne, Albert.....	Albert Detienne.....	85	1	35	2	8	1	1	1	1
4	Lynch, James.....	D. M. McDonald.....	60	1	40	2	2	1	1	1	1
5	McGuire, Mrs. Martha.....	Sam'l McGuire.....	120	1	26	3	6	1	1	1	1
6	Taylor & Co.....	Taylor & Co.....	122	1	107	2	8	1	1	1	1
7	Turpin, Ferris & Co.....	C. N. Turpin.....	207	1	55	2	4	1	1	1	1
8	Vandalia Coal Co.....	Vandalia Coal Co.....	231	1	92	2	4	1	1	1	1
9	Vandalia Fire Brick Co.....	Vandalia Fire Brick Co.....	174	1	64	2	4	1	1	1	1
10	Waddington Coal Co.....	Waddington Coal Co.....	215	1	40	1	6	1	1	1	1
	Totals.....		1,585	9	1	3	6	1	4	5	1

BARTON

1	Allen, F. L.....	F. L. Allen.....	60	1	2	4	1	1	1	1	1
2	Bell, J. W.....	J. W. Bell.....	60	1	1	1	1	1	1	1	1
3	Setz, J. W.....	Betz & Brenogel.....	100	1	2	4	1	1	1	1	1
4	Boulware Bros.....	John H. Lavery.....	220	1	2	4	1	1	1	1	1
5	Cameron, J. C.....	N. W. Wilhelm.....	110	1	2	1	1	1	1	1	1
6	Carr, W. T.....	W. T. Carr.....	34	1	1	2	1	1	1	1	1
7	Hanshaw, W. H.....	Thos. Williams.....	55	1	25	2	2	1	1	1	1
8	Joyce, A. H.....	Wm. Williams.....	60	1	1	1	1	1	1	1	1
9	Lanyon, S. H.....	S. H. Lanyon.....	86	1	45	3	3	1	1	1	1
10	Mann, B. F.....	Campbell & Stith.....	70	1	1	1	1	1	1	1	1
11	Miller, A. J.....	A. J. Miller.....	35	1	1	1	1	1	1	1	1
12	Prosser, Jno. J.....	Jno. J. Prosser.....	77	1	18	2	2	1	1	1	1
13	Spear, M. M.....	M. M. Spear.....	27	1	1	1	1	1	1	1	1
14	Still, W. H. & J. A.....	W. H. & J. A. Still.....	96	1	1	1	2	1	1	1	1
15	The Wear Coal Co.....	The Wear Coal Co.....	175	1	46	3	1	1	1	1	10
16	Travis, John.....	John Travis.....	140	1	18	2	4	1	1	1	1
17	Van Felt, Chas.....	C. C. Daubin.....	104	1	2	10	1	1	1	1	1
18	Wattman, Henry.....	J. H. Wattman.....	50	1	1	2	2	1	1	1	1
19	Walser, G. H.....	Thos. Cox & Co.....	147	1	40	2	2	1	1	1	1
20	Walser, G. H.....	W. R. Colby.....	105	1	142	2	2	1	1	1	1
21	Whitesell, H. J.....	H. J. Whitesell.....	260	1	2	6	1	1	1	1	1
	Totals.....		2,071	7	2	7	7	2	3	10	12

operated, the method or plan of working same, kind of plant, number from the respective mines for the year ending June 30, 1895, and

COUNTY.

Powder used.	Employes.			Prices paid for mining.			Tons of coal mined...	Price receiv'd per ton at mine.	Lump coal.	Run of mine	Once number..... Amount received for product.....					
	Miners	Others	Total	Summer	Summer	Winter										
Miles em- ployed.	Summer	Summer	Winter	Summer	Summer	Winter	Summer	Summer	Run of mine	Lump coal.	Once number..... Amount received for product.....					
Pillar and room Long-wall	No. of kegs	Cost to miner...	Winter...	Winter...	Winter...	Summer...	Winter...	Summer...	Run of mine	Lump coal.	Once number..... Amount received for product.....					
1 1 220	5 308	\$8.75	4 20	1 10	1 5	3 25	13 53½	13 \$43½	600 6,500	1.00 1.15	1 600 7,475					
1 1 6 4	4 90	45	8 1	1 1	1 1	2 9	9 75	9 75	1,100 15,310	1.00 1.16½	2 1,100 17,810					
1 8 225	316.75	7 5	122 55	10 5	132	60	.....	.....	23,510	1.15	4 26,986			

COUNTY.

1 1 30	3 45.	\$4.50	2 1	1 1	1 1	2 1	1 \$1.00	\$1.00	307 6,990	\$1.50 1.62½	1 1 \$460 11,358
1 1 6 2	2 1	1 1	2 1	1 1	1 1	2 1	2 86	86	172 150	1.50 1.50	2 258 225
1 1 3 1	1 1	1 1	3 1	1 1	1 1	3 1	1 1.00	1.00	150 1,200	1.50 1.00	4 225 200
1 1 6	1 1	1 1	6 1	1 1	1 1	7 75	7 75	7 75	1,200 1,355	1.20 1.20	5 1,625 1,625
1 1 11	11 2	3 3	14 1	14 1	14 1	14 70	70 70	70 70	1,355 1,273	1.20 1.20	6 2,164 2,164
1 1 2 2	42 38	9 9	51 9	47 9	47 9	47 90	90 90	90 90	22,473 2,591	1.00 1.00	7 2,591 2,591
1 1 1 1	11 11	11 11	6 6	17 6	17 6	17 86	86 86	86 86	1,100 1,100	1.00 1.00	8 29,214 29,214
1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	5 5	5 5	5 1.25	1.25 1.25	1.25 1.25	1,100 1,100	1.65 1.65	9 1,815 1,815
7 3 33	49.50	3 3	104 57	23 18	127 75	75	.....	.....	37,611	1.35	10 50,910

COUNTY.

1 1 150	\$300 00	3 3	20 15	4 3	24 18	18 60	\$ 50	100 3,200	\$1.55 1.00	1 1 \$155 3,200	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	1 1 4 2	2 2 1 2	1 1 25 60	1 1 25 60	80 1,416	1.75 1.12½	2 2 140 1,586	
1 1 1 1	1 1 1 1	1 1 1 1	3 3 1	3 3 1	3 3 1	3 3 75	3 3 75	495 495	1.75 1.00	3 3 85 495	
1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	50 50	1.75 1.75	6 88 88	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	86 86	1.20 1.20	7 97 97	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	200 200	2.00 2.00	8 400 400	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	210 210	1.50 1.50	9 315 315	
1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	50 50	2.00 2.00	10 100 100	
1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	87½ 87½	1.37½ 1.37½	11 131 131	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	95 95	1.75 1.75	12 140 140	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	80 80	2.00 2.00	13 200 200	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	2 2 1 2	200 200	400 400	14 400 400	
1 1 1 1	1 1 1 1	1 1 1 1	5 5 5 5	38 38 38	17 17 17	50 50 50	50 50 50	21,235 21,235	1.05 1.05	15 22,297 22,297	
1 1 1 1	1 1 1 1	1 1 1 1	2 2 2 2	2 2 2 2	2 2 2 2	1 00 1 00	1 00 1 00	465 465	1.25 1.25	16 588 588	
1 1 1 1	1 1 1 1	1 1 1 1	4 4 4 4	2 2 2 2	6 6 6 6	1 25 1 25	1 25 1 25	1,200 1,200	1.25 1.25	17 1,500 1,500	
1 1 1 1	1 1 1 1	1 1 1 1	6 6 6 6	3 3 3 3	8 8 8 8	1 25 1 25	1 25 1 25	400 400	1.75 1.75	18 700 700	
1 1 1 1	1 1 1 1	1 1 1 1	4 4 4 4	2 2 2 2	3 3 3 3	2 60 60	50 50	573 573	1.05½ 1.05½	19 606 606	
1 1 1 1	1 1 1 1	1 1 1 1	3 3 3 3	1 1 1 1	1 1 1 1	9 60 60	50 50	2,070 2,070	95 95	20 1,966 1,966	
1 1 1 1	1 1 1 1	1 1 1 1	10 10 10	10 10 10	10 10 10	10 10 10	10 10 10	4,385 4,385	1.00 1.00	21 4,885 4,885	
15 1,244	2,486 00	9 7	127	68	44	27	171	96	37,570	1.06	22 40,134

ANNUAL REPORT OF THE

STATISTICS OF

BATES

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Kind of opening	Thickness of coal seam inches.	Depth of shaft	Kind of power			How ventilated	Diameter of fan
							Horse power	Steam power	Furnace power		
1	Bearsoak, F. M.	Raney & Heatherly	150	1	8	2	1	1	1		
2	Borrow Bros.	Borrow Bros.	100	1	4	3	1	1	1		
3	Bovard, J. H.	J. C. Flansburg	35	1	2	8					
4	Boyce & Ferguson	Sullivan & Miller	130	1	4	1		1			
5	Brayton, Russell	J. D. Rowland	30	1	3	1					
6	Bruce & Rees Coal Co.	Bruce & Rees Coal Co.	60	1	115	3 10	1				1 12
7	Dabney, E. C.	E. C. Dabney	105	1	3	1					
8	Doolittle, John	John Doolittle	110	1	3	6					
9	Galley & Brown	C. W. Field	90	1	3	3	1				
10	Gauf, J. M.	J. M. Gauf	60	1	2	6					
11	Griggs, J. C.	J. C. Griggs	65	1	4	4					
12	Hudson, L. G.	L. G. Hudson & Co.	75	1	2	10	1		1		
13	Kansas Lime, Coal Co.	C. T. Seaver	110	1	8	1					
14	" "	Kansas Lime, Coal Co.	200	1	3	1					
15	Lewis, O. H.	Jno. Gerodo	80	1	3	1					
16	Martin & Gee	Martin & Gee	200	1	4	6	1		1		
17	Mo. & Kans. Land Co.	D. D. Peller	170	1	4	10					
18	Nickel, Jno.	Jno. Nickel	19	1	3	1					
19	Pearson, Peter	Peter Pearson	240	1	5	6					
20	Philadelphia Con. Co.	J. J. Riddle	14	1	2	1					15
21	Rich Hill C. & M. Co.	Rich Hill Coal & Min. Co.	191	1	106	4	1				1 10
22	" " No. 18	" "	133	1	3	6	1				1 12
23	" " No. 19	" "	192	1	102	3	6	1			1 8
24		David Rees	110	1	3	1					
25	Tatley, J. M.	J. M. Tatley	260	1	2	9	1		1		
26	Rankin Bros.	Rankin Bros.	205	1	2	10	1		1		
27	Washburn, Henry	Henry Washburn	100	1	45	3	1		1		
28	Young, Geo.	Geo. Young	90	1	36	3	1		1		
Totals			3,315	5	9	2	12		5 10	1	6 5 5

BOONE

1	Blackfoot Coal Mine	W. A. Gooodding	180	1	127	8	1	1	1		
2	Buckley, H. T.	Geo. Bryant	100	1	3	6	1	1	1		
3	Carter Bros.	Carter Bros.	105	1	75	3	1	1	1		
4	Columbia Coal Co.	Columbia Coal Co.	225	1	112	3	4	1	1		
5	Gordon, S. D.	S. D. Gordon	100	1	3	1		1	1		
6	Gossett, Jno. F.	Jno. F. Gossett	160	1	2	6		1	1		
7	Harris, J. L.	J. L. Harris	35	1	1	6		1	1		
8	Quittin, L.	L. Quittin	150	1	3	1		1	1		
9	Hogers Bros.	Geo. Rogers	60	1	20	2	6	1	1		
10	Rummunds, Saml.	Saml. Rummunds	45	1	3	4	1		1		
11	Stidham, W. A.	W. A. Stidham	70	1	3	10					
12	Stone, J. W.	J. W. Stone	27	1	2	6					
13	Sublett, S. T.	S. T. Sublett	50	1	2	6		1	1		
14	White & Co., M. W.	M. W. White & Co.	90	1	4	1		1	1		
15	Zarring, N. B.	N. B. Zarring	36	1	3	1		1	1		
Totals			1433	4	4	5	2		1	4	8
									7	6	

COAL MINES--Continued.

COUNTY.

Office number.....	Amount received for product.....	Tons of coal mined..	Employees.			Prices paid for mining.	Price receiv'd per ton at mine.	Lump coal.	
			Miners	Others	Total.				
					Summer	Run of mine			
Pillar and room	No. of kegs	Miles em- ployed.	Cost to miner, ..	Winter	Summer	Winter	Summer	Winter	
Long wall.....									
1	6	\$9 00		4	2	1	\$ 65	\$ 65	
	12	18 00		1	1	2	1	300	
1	50	75 00	2	8	2	10	50	1 12½	
	1	500	575 00	4	50	5	1,800	1 00	
	12	18 00		2	2	4	280	1 25	
1	44	73 70	1	4	1	5	50	10,000	
	1	1 50		1	1	2	90	90	
	1	82	56 00	1	4	1	75	83½	
	1	45	78 75	1	5	2	60	900	
	1	240	408 00	1	10	6	14	1 00	
	1	400	700 00	3	2	10	9	900	
	20	30 00		1	1	2	16	1 00	
						15	16	1 00	
						16	17	1 00	
						17	18	1 00	
1	9,251	9,251 00	22 22	189	194	21	20	194,223	
1	2,392	2,392 00	55	47	7	6	62	98	
1	3,817	3,817 00	7	7	79	74	12	37,605	
1	510	586 50	5	5	35	30	6	80,245	
1	40	66 00		2	1	1	1	80,000	
1	100	160 00		7	2	1	8	1 41	
1	95	142 50		6	3	2	8	25,515	
1	5	8 75		4	2	2	6	22	
16	17,572	18,466 70	48 37	481	380	98	59	375,300	
								98	
								337,888	

COUNTY.

1	128	\$182 00	2	1	20	6	2	1	22	7	75	75	4,560	\$1 25	\$6 840	1
1	3	4 25		2		2		2		2	75	75	300	1 00	3 00	2
1	85	122 50		16	5	2	1	15	6	87½	87½	3,000	1 25	.....	3,750	3
1	3 3	35	25	7	7	42	32	70	70	70	70	7,500	1 25	9,375	4
1	100	150 00		15	8	1	1	16	9	\$1 00	\$1 00	2,400	.....	\$1 73	4,200	5
1	7	10 50		2	1		2	1	75	75	290	290	1 25	.....	350	6
1	3	2 70		2			2		2	1 00	80	80	1 50	.....	120	7
1	25	43 75		3	2		3	2	75	70	920	920	1 00	.....	920	8
1	6	9 90		5	2	1	1	6	4	75	75	420	.....	2 20	924	9
1	7	10 50	1	3			3		1 25	200	200	200	2 00	.....	400	10
1	3	4 80		2		2		2	75	160	160	160	1 00	.....	160	11
1	2	3 30		2		2		2	70	78	78	78	1 00	.....	78	12
1	.....	2		2		2		2	70	120	120	120	1 00	.....	132	13
1	.....	1				1		1	60	360	360	360	1 00	.....	360	14
1	12	369	544 20	6	4	106	51	17	11	123	62	20,428	.....	\$1 37	\$27,959	15

ANNUAL REPORT OF THE

STATISTICS OF

CALDWELL

Office number.	Name of company or mine owner.	Name of operator.	No. of days worked.	Kind of opening	Diameter of fan ...						
					Thickness of coal seam	Kind of power	How ventilated	Fan	Furnace	Natural	Electricity
1	Caldwell Coal Co.	Caldwell Coal Co.	225	1	507	1	7	1	1	1	10
2	Kingston Coal Co.	Kingston Coal Co.	180	1	242	1	8	1	1	1	-
	Totals .....	.....	405	2	.....	.....	2	.....	1	1	1

CALLAWAY

1	Carbon Valley Mine	J. W. Simmons.....	250	1	2	1	1	1	1	1	...
2	Castle, Wm.	Wm. Castle.....	257	1	2	1	1	1	1	1	...
3	Curd, Edwin	Massey & Reynolds.....	60	1	2	1	1	1	1	1	...
4	Fulton Fire Brick & M. Co.	Fulton Fire Brick & M. Co.	250	1	100	2	6	1	1	1	8
5	Harris, John	John Harris.....	215	1	40	2	6	1	1	1	...
6	Marsenkov, John	John Marsenkov.....	120	1	50	3	1	1	1	1	...
7	Smith, James	James Smith.....	180	1	2	8	1	0	1	1	...
8	Thorpe, R. F.	R. F. Thorpe.....	120	1	12	2	6	1	0	1	...
9	Weeks, W. C.	W. C. Weeks.....	90	1	6	1	1	1	1	1	...
	Totals .....	.....	1542	4	2	3	1	5	3	6	2

CARROLL

1	Brooks, Henry	Henry Brooks.....	75	1	2	2	1	1	1	1	...
2	Christmas Mine	Geo. W. Williams.....	60	1	12	1	1	1	1	1	...
3	Cunningham, J. B.	M. Kirkman.....	90	1	1	1	8	1	1	1	...
4	Farr, Ralph	Ralph Farr.....	95	1	2	1	1	1	1	1	...
5	Hughes, Wm.	Wm. Huges.....	105	1	1	1	16	1	1	1	...
6	Ogle, W. F.	W. F. Ogle.....	68	1	2	1	1	1	1	1	...
7	Reynolds, W. F.	W. F. Reynolds.....	80	1	1	1	8	1	1	1	...
8	Scott, W.	W. Scott.....	20	1	28	1	10	1	1	1	...
9	Whitehead, Jas.	Jas. Whitehead.....	60	1	1	1	8	1	1	1	...
10	Wilcoxson, H. H.	H. H. Wilcoxson.....	25	1	2	1	1	1	1	1	...
	Totals	628	2	1	2	5	3	2	5	...

CASS

1	Wallis, D. B.	D. B. Wallis.....	90	1	160	3	6	1	1	1	-
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CEDAR -

1	Bouker, N. J.	M. M. Anderson	53	1	1	1	8	1	1	1	...
2	Davis Mine	Jas. M. Connor	80	1	2	1	1	1	1	1	...
3	Duncan, J. C.	J. C. Duncan	70	1	1	1	10	1	1	1	...
4	Heifner, Isaac	John Moore	50	1	2	8	1	1	1	1	...
5	McLeod, J.	J. M. Bridgewater	25	1	1	1	8	1	1	1	...
6	Poague, Geo. M.	Geo. M. Poague	105	1	2	2	2	1	1	1	...
7	Schroeder, C. M.	C. M. Schroeder	115	1	1	1	10	1	1	1	...
8	Young, J. H.	J. H. Young	108	1	3	6	1	1	1	1	...
	Total .....	.....	.....	1	3	3	.....	5	5	5	...

COAL MINES—Continued.

COUNTY.

Office number.	Amount received for product.									
Tons of coal mined.	Prices paid for mining.			Lump coal		Run of mine		Price receiv'd per ton at mine.		
Summer ..	Miners	Others	Total.	Summer ..	Winter. ..	Summer ..	Winter. ..	Summer ..	Winter. ..	
Mules employed.	Summer ..	Winter. ..								
Powder used.	Cost to miner ..	No. of kegs								
Pillar and room ..	2	2	80	60	6	6	86	\$1 10	87½	\$1 50
Long-wall ..	1	1	14	14	5	5	19	1 12½	1 12½	1 84
	2	2	94	74	11	11	105	85	.....	19,780

COUNTY.

1	.	.	.	.	4	2	1	1	5	3	\$1 00	87½	1,949	.	\$1 50	\$2,923	1	
1	.	.	.	.	8	6	1	...	9	6	87½	87½	2,420	.	1 25	3,000	2	
1	.	.	.	.	3	...	...	...	3	...	87½	...	270	.	1 50	405	3	
1	.	.	.	.	3	3	30	20	5	4	35	24	75	75	10,600	1 35	14,310	4
1	.	.	.	.	15	2	2	1	17	3	87½	87½	3	8,200	.	1 21	3,872	5
1	.	.	.	.	2	...	...	...	1	3	1 00	...	...	400	.	1 50	600	6
1	.	.	.	.	1	10	...	...	2	12	87½	...	...	2,993	.	1 62½	4,863	7
1	.	.	.	.	1	...	...	...	1	2	75	...	...	200	.	1 50	300	8
1	.	.	.	.	1	...	...	...	1	2	70	...	...	160	.	1 75	280	9
9	4	3	74	30	14	6	88	86	22,182	.	\$1 38	\$30,553	

COUNTY.

1	1	\$2 00	5	5	\$1 12½	554	\$2 00	\$1,068
-	-	-	2	2	80	190	1 50	280
-	1	-	-	1	1 25	200	2 00	400
-	-	-	-	3	-	400	1 75	700
-	-	-	-	2	-	240	1 50	360
-	-	-	-	4	-	400	1 75	700
-	-	-	-	1	1	50	1 75	88
-	1	-	-	2	-	1 25	70	80
-	-	-	-	2	2	-	2 00	140
-	-	-	-	2	1 00	150	2 00	300
-	1	-	-	2	-	70	1 75	122
2	3	1	\$2 00	13	13	26	\$1 80	\$4,158
						2,304		

COUNTY.

... | 1 | 80 | \$45.00 | ... | 6 | ... | 1 | ... | 7 | ... | 85 | | 1,000 | | \$1.50 | \$1,500 | 1

COUNTY.

STATISTICS OF

CHARITON

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Kind of opening		Kind of power.	How ventilated	Diameter of fan
				Strip..	Dirt..			Fan
1 Grotjan, Louis.....	Green Taylor.....	90	1	1	4	1	1	1
2 Isle, A. F.....	A. F. Isle.....	60	1	1	6	1	1	1
3 Isle, R. W.....	R. W. Isle.....	52	1	1	4	1	1	1
4 Kahler, Valentine.....	Valentine Kahler.....	10	1	1	6	1	1	1
Totals	212	1 8	1	1	1

CLAY

1 Missouri City Coal Co....	Missouri City Coal Co	175	1	1	54	2	1	1	1
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COOPER

1 Hazell, Chas. W	Chas. W. Hazell	95	1	1	6	1	1	1	1
2 Jenkins, H. W.....	H. W. Jenkins	65	1	1	6	1	1	1	1
3 Missouri Valley Coal Co..	C. E. Andrews.....	105	1	80	1 8	1	1	1	1
Totals .....	.....	265	1	2	.....	1	2	3	.....

DADE

1 Allen, Wm.....	Thos. Allen.....	150	1	1	4	1	1	1	1
2 Farmer, J. H.....	J. H. Farmer	60	8	2	8	1	1	1	1
3 Finney, W. S.....	W. S. Finney.....	105	1	3	6	1	1	1	1
4 Gardner, W.....	T. H. Gardner	120	1	2	8	1	1	1	1
5 McCluey, Robert	Robert McCluey	100	1	2	4	1	1	1	1
6 Neal, Jno. H.....	Jno. H. Neal	105	1	2	4	1	1	1	1
7 Seaton, J. R.....	W. E. Seaton	70	1	3	6	1	1	1	1
8 Star Mine	L. Waterbury	129	1	20	2 4	1	1	1	1
Totals .....	.....	839	1 6	1	4	4	8	1	1

GRUNDY

1 Grundy County Coal Co..	Grundy County Coal Co.	230	1	1	6	1	1	1	1
2 Bailey, C. Tom.....	Bailey, C. Tom.....	130	1	21	1 8	1	1	1	1
Totals .....	.....	360	2	2	2	1	1	1	1

COAL MINES—Continued.

COUNTY.

Office number.....	Amount received for product.....	Employes			Prices paid for mining.	Tons of coal mined	Price receiv'd per ton at mine.	Lump coal.
		Miners	Others	Total.				
Mules em- ployed.....		Summer.....	Summer.....	Summer.....	\$1 00	150.....	\$2 00	300
Powder used.	Cost to miner...	Winter.....	Winter.....	Winter.....		110.....	2 00	220
Filar and room.....	No. of kegs	Summer.....	Summer.....	Summer.....		80.....	2 00	160
Long-wail.....		Winter.....	Winter.....	Winter.....		15.....	2 00	30
						355.....	\$2 00	\$710

COUNTY.

1 | - | | | 1 | 1 | 24 | 24 | 8 | 8 | 32 | 32 | 87½ | 75 | 6,500 | \$1 25 | | \$8,125 | 1

COUNTY.

1				2	2		2	2	\$1 25	\$1 25		250		\$1 75	437	1
				2			2		1 25			200		1 75	350	2
				2	2		2	2	1 25	1 25		300		2 25	675	3
1	1			6	4		6	4				750		\$1 95	\$1 462	

COUNTY.

COUNTY.

1	...	.....	4	3	100	125	22	22	122	147	\$1 00	\$1 00	39,500	.....	\$1 70	\$61,200	1
1	...	.....	4	3	8	4	2	2	10	6	1 00	1 00	1,500	.....	1 50	2,550	2
.....	.....	.....	4	3	108	129	24	24	132	153	.....	.....	41,000	.....	\$1 55	\$63,450	

STATISTICS OF

HENRY

Office number.	Name of company or mine owner.	Name of operator.	No. of days worked..	Kind of opening		Thickness of coal seam inches.	Kind of power.	How ventilated	Diameter of fan....		
				Strip-dit.	Drift, Slope, Shaft,.....				Feet	Steem.....	Fan
1	Barth, John.....	S. B. Price	80	1	.....	1	9	.....	1	.....	1
2	Braun Coal Co.....	Edw. Braun.....	150	1	.....	60	3	2	1	.....	1
3	Central Coal & Coke Co.	Central Coal & Coke Co.	145	1	.....	60	2	6	1	.....	1
4	Clark David.....	Robert L. Hess.....	75	.....	.....	1	1	.....	.....	.....	.....
5	Co operative Coal Co.....	Co-operative Coal Co.....	145	1	.....	75	2	6	1	.....	1
6	Colorado C. Shaft No. 3.	D. C. Blanchard & Sons.....	180	1	.....	80	3	1	.....	.....	1
7	England, Wm.....	Wm. England.....	80	1	.....	25	2	8	1	.....	1
8	Grahart, Theo.....	Theo. Garhart.....	150	.....	.....	1	4	.....	.....	.....	.....
9	Hines Mine.....	J. W. Shook.....	300	1	.....	40	4	.....	1	.....	1
10	Hughes, W. E.....	W. E. Hughes.....	178	1	.....	19	4	10	1	.....	1
11	Hurst, John.....	John Hurst.....	150	1	.....	31	2	10	1	.....	1
12	McFadden, H. B.	H. B. McFadden.....	40	1	.....	2	6	1	.....	.....	1
13	McLeod Mine.....	Griffith & Nichols.....	90	1	.....	28	1	10	1	.....	1
14	Marvin, Mrs. A.	J. L. Arnold.....	30	.....	.....	1	1	8	.....	.....	.....
15	Milier, W. J.	L. W. Beaman.....	185	1	.....	35	5	.....	1	.....	1
16	Moberly, J. W.	J. W. Moberly.....	25	.....	.....	1	2	.....	.....	.....	.....
17	Ralls, J. D.	J. D. Ralls.....	90	.....	.....	1	1	8	.....	.....	.....
18	Reese, Wm.....	Wm. Reese.....	280	1	.....	3	.....	1	.....	.....	1
19	Rusk, Wm.....	Wm. Rusk.....	250	1	.....	35	2	8	1	.....	1
20	Rustler Mine.....	S. Mantle & Son.....	90	1	.....	45	3	.....	1	.....	1
21	Stockton Bros.	Stockton Bros.....	145	1	.....	34	2	2	1	.....	1
22	Thompson & Co., R. L.	R. L. Thompson & Co.....	240	1	.....	40	3	6	1	.....	1
23	Thompson & Co., R. L.	R. L. Terrill.....	120	1	.....	25	3	.....	1	.....	1
24	Trimble Mine.....	S. R. Johnson.....	60	.....	.....	1	2	.....	.....	.....	.....
25	Vickers, W. W.	E. E. Trimble.....	40	.....	.....	1	2	.....	.....	.....	.....
26	Victor, S. M.	Jno H. Keller.....	90	.....	.....	1	1	4	.....	.....	1
27	Morris & Bogard.....	Morris & Bogard.....	121	1	.....	75	2	8	1	.....	1
28	Stephens, Henry.....	Henry Stephens.....	120	1	.....	3	.....	1	.....	.....	1
29	Pigg, D. B.	D. B. Pigg.....	40	.....	.....	2	6	1	.....	.....	1
30	Tebo Coal Co.....	Tebo Coal Co.....	150	1	.....	35	2	6	1	.....	1
Totals			3838	17	4	1	8	.....	5	16	1
									6	11	5

HOWARD

1	Fayette Mining Co.....	Fayette Mining Co	279	.....	1	.....	1	3	.....	1	1
2	Lockridge, B. M.....	B. M. Lockridge.....	90	1	.....	1	6	.....	1	.....	1
	Totals		369	1	1	2	1	1

JACKSON

1	Brush Creek Coal & M. Co	Brush Creek Coal & M. Co	170	1	300	1	10	1	1
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JOHNSON

1	Meiley, M. B.....	M. B. Meiley.....	100	1	1	8	1	1
2	Marley, J. S.	J. Bryd.....	110	1	2	4	1	1
3	Thomas, John.....	Thomas & Anthony.....	120	1	2	4	1	1
4	Thomas, T. B.	Herrington Bros.....	40	1	.....	1	10	.....	1	.....	1
5	Wood, B. F.	B. F. Wood.....	270	1	.....	2	.....	1	.....	1	.....
	Totals		640	4	1	.....	.....	.....	5	4	1

COAL MINES—Continued.

COUNTY.

Pillar and room Long wall	Powder used	Employees.			Prices paid for mining.	Tons of coal mined	Price receiv'd per ton at mine.	Office number.						
		Miners	Others	Total.										
				Run of mine										
No. of kgs	Miles em-ployed.	Cost to miner.	Winter	Summer	Winter	Summer	Summer	Winter						
1	1	1,000	00	4	2	2	\$1 50	240	\$2 00	\$480	1			
1	500	1,000	00	35	35	1	1 90	80	1,448	1 37½	1,991	2		
1	10	20	2	2	2	2	1 41	41	14,000	1 50	21,000	3		
1	250	500	2	1	10	12	5	15	17	230	1 50	350	4	
1	10	20	2	2	2	1	1	3	22	70	2,900	1 25	3,625	5
1	50	62	50	2	2	8	8	10	10	85	6,000	1 25	7,500	6
1	59	87	50	6	4	2	2	8	6	75	250	1 25	812	7
1	16	32	00	4	2	1	1	5	3	75	3,000	1 25	3,750	8
1	135	189	00	10	6	1	1	11	7	1 00	3,600	1 50	5,400	9
1	10	15	00	5	1	1	6	6	90	2,815	1 40	4,040	11	
1	17	25	50	5	1	1	6	6	1 00	306	1 50	469	12	
1	36	66	50	6	4	2	2	8	6	500	1 43	715	13	
1	36	66	50	6	4	2	2	8	6	80	1 50	120	14	
1	300	375	00	12	10	3	3	15	13	75	360	1 50	120	16
1	25	33	75	3	1	1	1	3	2	90	6,000	1 25	7,500	18
1	30	45	00	4	1	1	1	3	2	1 00	642	1 50	1,043	19
1	240	480	00	14	12	2	2	16	14	480	720	1 50	720	20
1	100	200	00	1	1	18	16	2	2	20	1,020	1 50	1,790	21
1	2	1	50	20	4	2	54	22	90	80	4,800	1 25	6,000	22
1	8	4	8	4	8	4	8	4	1 00	2,800	1 25	4,800	23	
1	12	12	4	4	16	16	70	70	90	240	2 00	480	24	
1	2	2	25	25	8	8	33	33	70	260	2 00	520	25	
1	16	13	9	263	178	75	53	338	231	360	2 00	720	26	
6	16	13	9	263	178	75	53	338	231	13,600	1 35	18,225	27	
										1,590	1 25	1,987	28	
										970	1 25	2,212	29	
										8,125	1 25	10,160	30	
										78,551	1 37	107,784		

COUNTY.

1	1	1	12	6	2	2	14	8	\$1 00	\$1 00	3,000	\$2 00	\$6,000	1
2	2	2	2	2	2	2	2	2	1 25	1 25	220	1 75	385	2
2	2	2	14	6	2	2	16	8	3,220	1 98	\$6,385	

COUNTY.

1	2	2	65	40	10	10	75	50	1 12½	87½	18,000	1 25	22,500	
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COUNTY.

4	2	2	4	2	2	4	2	2	\$1 25	\$1 25	1,600	1 50	1,500	1
1	3	1	4	4	4	4	4	4	87½	75	545	1 10	600	2
1	4	4	4	4	4	4	4	4	87½	600	600	1 25	750	3
1	2	2	2	2	2	2	2	2	86	196	196	1 25	245	4
1	4	2	1	1	5	3	1	2	1 25	1,620	1,620	1 75	2,835	5
4	17	4	2	1	19	5	12½	12½	.....	3,961	3,961	1 50	5,930	

STATIST

LAFA

Office number.	Name of company or mine owner.	Name of operator.	No. of days worked.	Kind of opening	Kind of power.					
					Thickness of coal seam	Feet	Inches.	Electricity	Hand.	Horse.
1	Alcorn & Son	Wm. Alcorn	150	1	60	1	2	1	1	1
2	Alice B. Hays	Hays Coal Co	179	1	1	2	2	1	1	1
3	Armstrong, Joseph	Harry St. Clair	100	1	34	1	4	1	1	1
4	Bancom, John	John Bancom	20	1	1	6	1	1	1	1
5	Beatty Coal Co., G. B.	G. B. Beatty	140	1	25	1	6	1	1	1
6	Beatty & Campbell	Beatty & Campbell	140	1	36	1	6	1	1	1
7	Bell & Greer	W. H. Greer	130	1	70	1	8	1	1	1
8	Bonanza Coal Co	S. W. Brandon	125	1	15	1	6	1	1	1
9	Bond, Geo.	Geo. Bond	100	1	15	1	6	1	1	1
10	Blackburn Coal Co.	Fritz Stokes	120	1	33	1	9	1	1	1
11	Carter & Son	Carter & Son	200	1	1	6	1	1	1	1
12	Clark, Thos.	Theo. Altschaffer	200	1	1	6	1	1	1	1
13	Colman, Frank	Frank Colman	90	1	1	6	1	1	1	1
14	Corder Coal Co.	Corder Coal Co.	105	1	72	1	5	1	1	1
15	Con. Farmers' Coal Co.	Con. Farmers' Coal Co.	200	3	1	75	1	6	3	1
16	Daisy Hill Coal Co.	W. H. Bell	105	1	25	1	6	1	1	1
17	Dover Coal Co.	Dover Coal Co.	150	1	2	1	0	1	1	1
18	Duncan, Chas. E.	Jno. H. Grim	180	1	1	6	1	1	1	1
19	Fox, N. F.	G. Dennis	120	1	50	1	2	1	1	1
20	Gaffin, O. M.	O. M. Gaffin	170	1	25	1	8	1	1	1
21	Haygood Coal Co.	Gunn Bros.	110	1	18	1	5	1	1	1
22	Holwell, M.	M. Holwell	130	1	60	1	7	1	1	1
23	Hughes, H. C.	J. W. Hughes	200	1	72	1	6	1	1	1
24	Kresse, A. F.	A. F. Kresse	150	1	20	1	0	1	1	1
25	Kreutz, Fred	M. Z. Frazier	100	1	1	6	1	1	1	1
26	Lex. C. M. Co., McD. M.	Lexington C. M. Co.	156	1	43	1	8	1	1	1
27	L. C. M. Co., Rev. No. 1 M	" "	197	1	1	8	1	1	1	1
28	Lex. C. M. Co., Grady M.	" "	215	1	1	9	1	1	1	1
29	Lex. C. M. Co., Seawell M.	" "	114	1	1	8	1	1	1	1
30	O'Malley, Andrew	Andrew O'Malley	100	1	20	1	8	1	1	1
31	Osborn, Joseph	Joseph Osborn	90	1	1	6	1	1	1	1
32	Osborn, Geo.	George Osborn	70	1	1	6	1	1	1	1
33	McGrew, J. C.	J. C. McGrew	100	1	1	6	1	1	1	1
34	Macey, Henry	Henry Macey	100	1	1	10	1	1	1	1
35	Mathew's Coal Co.	Mathews & Strasburg	125	1	140	1	6	1	1	1
36	Missouri River Coal Co.	Mack Warner	95	1	60	1	8	1	1	1
37	Moore, D. J.	D. J. Moore	60	1	1	6	1	1	1	1
38	Morgan, W. P.	W. P. Morgan	135	1	1	6	1	1	1	1
49	Norfleet, T. J.	Daggs & Bush	110	1	25	1	6	1	1	1
40	Perry, Thos.	Thos. Perry	90	1	1	2	1	1	1	1
41	Riley & Keist	Riley & Keist	100	1	60	1	6	1	1	1
42	Roswell & Bro., James	James Roswell	200	1	75	1	10	1	1	1
43	Salt Fork Coal M. Co.	Salt Fork Coal M. Co.	180	1	35	1	6	1	1	1
44	Southwestern Coal Co.	Southwestern Coal Co.	120	1	110	1	8	1	1	1
45	Spence, Seth	Seth Spence	190	1	1	8	1	1	1	1
46	Strathman, Henry	Geo. Urban	110	1	22	1	6	1	1	1
47	Seawell & Co., J. M.	J. M. Seawell & Co.	105	1	40	1	10	1	1	1
48	Summers, M. W.	M. W. Summers	205	1	2	1	0	1	1	1
49	Thomas, Frank	Frank Thomas	120	1	1	6	1	1	1	1
50	Walton, Thos.	Thos. Walton	260	1	1	6	1	1	1	1
51	Walnut Grove	J. P. Hendrick	120	1	1	6	1	1	1	1
52	Waverly Coal M. Co.	Waverly Coal M. Co.	200	1	100	3	6	1	1	1
53	Woskoski, M.	M. Woskoski	200	1	1	6	1	1	1	1
Totals					8,031	30	6	20		\$ 15 32

STATE MINE INSPECTOR.

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COAL MINES—Continued.

COUNTY.

Powder used.	Mules em- ployed.	Employees.			Prices paid for mining.	Tons of coal mined ..	Price receiv'd per ton at mine.	Lump coal.	Office number.. .	
		Miners	Others	Total.					Run of mine	
				Winter ..		Summer ..	Winter ..	Summer ..	Run of mine	
Pillar and room	Winter ..	8	2	10	\$1 62½	\$1 87½	325	\$2 25	\$812 1	
Lone wall	Summer ..	35	20	55	1 00	87½	14,320	1 35	19,332 2	
		2	1	3	1 00	1 00	160	1 75	280 3	
		2	2	4	1 12½	1 12½	40	1 75	70 4	
		35	5	40	6 1 00	75	7,642	1 55	11,845 5	
		50	15	65	2 1 00	75	13,531	1 55	20,973 6	
		25	4	29	5 1 12½	87½	2,800	1 62½	4,550 7	
		50	6	56	7 1 00	75	6,000	1 50	9,000 8	
		10	1	11	1 00	.....	2,000	1 75	3,500 9
		6	2	8	2 1 00	1 00	1,200	2 00	2,400 10	
		18	6	24	1 00	87½	7,134	\$1 22½	8,739 11	
		5	2	7	3 1 12½	1 00	1,200	1 50	1,800 12	
		2	2	4	1 00	.....	450	1 50	675 13
		40	20	60	4 4 1 00	87½	5,000	1 25	6,250 14	
		8	150	158	20 5 170	55 1 00	75	34,102	58,108 15	
		1	2	3	1 1 4	2 1 00	87½	450	1 62½ 16	
		1	15	16	5 2 17	7 1 00	87½	3,000	3,750 17	
		4	1	5	5 2 1	1 00	87½	1,052	1 50	
		2	2	4	2 1 2	1 25	255	3 00	510 19	
		4	2	6	3 1 12½	87½	1,656	1 50	2,484 20	
		15	3	18	1 00	.....	2,800	1 50	4,200 21
		4	4	4	1 1 1 1	1 12½	448	1 50	672 22	
		20	6	26	7 1 00	87½	3,300	1 50	5,004 23	
		2	1	3	2 1 1 1	1 12½	360	1 62½	585 24	
		2	1	3	1 1 1 1	1 12½	400	2 00	800 25	
		6	84	90	18 14 102	79 87½	75	29,732	36,880 26	
		8	95	82	22 20 118	102 87½	75	47,182	58,275 27	
		8	7	83	75 36 30	121 105	50 45	44,345	54,250 28	
		5	7	56	10 66 2	87½	11,612	1 25	14,537 29	
		2	3	3	.....	50	200	1 00	200 30
		2	1	3	1 1 1 1	1 12½	300	1 50	450 31	
		2	1	3	1 1 1 1	1 12½	120	1 50	180 32	
		4	60	10	8 2 68	12 1 00	87½	12,000	16,840 33	
		4	2	65	7 2 72	1 00	.....	12,260	16,551 34
		2	20	15	5 3 25	18 1 00	75	2,289	3,207 35	
		4	40	20	3 2 43	22 87½	75	4,500	5,625 36	
		2	2	2	1 1 1 1	1 12½	120	2 00	240 37	
		2	1	2	1 1 1 1	1 12½	500	1 50	750 38	
		4	1	5	1 1 1 1	1 12½	540	1 75	945 39	
		2	1	2	1 1 1 1	1 12½	115	1 75	201 40	
		4	1	5	1 1 1 1	1 12½	400	1 62½	650 41	
		3	1	3	1 1 1 1	1 12½	720	1 50	1,080 42	
		34	15	7	3 41 18	87½	75	11,405	17,875 43	
		2	1	65	20 9 3 74	23 1 00	87½	8,317	11,440 44	
		2	1	1	3 1 1 1	1 12½	470	1 50	705 45	
		1	1	1	1 1 1 1	1 12½	188	1 75	329 46	
		27	2	29	1 00	.....	3,200	1 50	4,800 47
		10	2	10	2 1 1 1	1 12½	2,172	1 75	3,801 48	
		4	1	5	1 1 1 1	1 12½	800	1 50	1,200 49	
		7	6	1	8 6 1	1 12½	2,450	1 50	3,675 50	
		2	1	2	1 1 1 1	1 12½	270	1 92½	439 51	
		70	\$80 50	6	2 1 7	2 65	65	1,063	1 50	1,534 52
		2	1	2	1 1 2 1	1 12½	400	1 50	600 53	
54	2	70	\$80 50	51	27 1196	475 198	101 1389	576	307,286	\$1 38 \$425,967

STATISTICS OF

LINN

Office number.....	Name of company or mine owner.	Name of operator.	No. of days worked..	Diameter of fan.....									
				Kind of opening	Strip-pit	Drift	Slope	Shaft	Fan	Furnace	Natural	Electricity	Hand
1 Bottomly, J. C.....	J. C. Bottomly.....		204	1	150	2	3	1	1	1	1	1	1
2 Brookfield Coal Co	Brookfield Coal Co		200	1	155	2	5	4	1	1	1	1	1
3 Fifield, Moses.....	M. Fifield		228	1	148	2	3	1	1	1	1	1	1
4 Landrith & Son.....	Landrith & Son		182	1	130	2	4	1	1	1	1	1	1
5 Marceline Coal Co.....	Marceline Coal Co		201	1	185	2	4	1	1	1	1	1	1
6 Schaeffer, Bernard.....	Bernard Schaeffer		186	1	155	2	2	1	1	1	1	1	1
Totals			1,201	6					2	1	3	1	4

LIVINGSTON

1 Cox, W. A.....	W. A. Cox.....	160	1	60	1	8	1	1	1	1	1	1	1
2 Moorsville Coal Co	Robt. Ford.....	120	1	50	1	10	1	1	1	1	1	1	1
Totals		280	2						2	1	1	1	1

MACON

1 Baldwin, D. B.....	W. H. Phillips	60	1	1	1	8	1	1	1	1	1	1	1
2 Bevier Black Diamond	Bevier Black Diamond	166	1	50	4	6	1	1	1	1	1	1	1
4 Janies & Son	James & Son	105	1	50	4	6	1	1	1	1	1	1	1
3 Freelee, Wm.....	Freelee, Wm	90	1	1	1	6	1	1	1	1	1	1	1
5 Kansas & Texas Coal Co	Kansas & Texas Coal Co	187	1	4	1	1	1	1	1	1	1	1	1
6 " " "	" " "	91	1	135	4	1	1	1	1	1	1	1	1
7 " " "	" " "	241	1	168	4	1	1	1	1	1	1	1	1
8 Little Pittsburg Coal Co	Little Pittsburg Coal Co	177	1	185	3	10	1	1	1	1	1	1	1
9 Loomis Coal Co.....	R. G. Raumbauer	130	1	60	4	6	1	1	1	1	1	1	1
10 Richmond, J. G.....	Campbell & Gorman	165	1	5	1	1	1	1	1	1	1	1	10
11 Terrill, R. S.....	R. S. Terrill	60	1	1	1	10	1	1	1	1	1	1	1
12 Vese, David.....	David Vese	90	1	140	2	1	1	1	1	1	1	1	1
13 Watson Coal Co	W. S. Watson	186	1	85	4	6	1	1	1	1	1	1	1
Totals.....		1,748	8	2	3	1	1	1	1	1	1	1	1

MONTGOMERY

1 Black Diamond.....	H. A. Denis.....	148	1	44	2	6	1	1	1	1	1	1	1
2 Buford & Noell.....	Buford & Noell	250	1	30	2	6	1	1	1	1	1	1	1
3 Vandalia Coal Co	Vandalia Coal Co	200	1	100	2	4	1	1	1	1	1	1	1
Totals.....		598	3	1	1	1	1	2	1	2	1	2	1

NODAWAY

1 Bird, C.....	G. Bird	120	1	30	1	4	1	1	1	1	1	1	1
2 Bridges, Thos.....	Thos. Bridges	90	1	1	1	1	1	1	1	1	1	1	1
3 Carpenter, Roy.....	H. Mason & Son	110	1	71	2	1	1	1	1	1	1	1	1
4 Ellenworth, Rufus.....	Rufus Ellenworth	100	1	16	1	4	1	1	1	1	1	1	1
5 Martin, Henry W.....	Wm. Miller	110	1	1	1	1	1	1	1	1	1	1	1
6 Nichols Bros.....	Nichols Bros	60	1	38	1	1	1	1	1	1	1	1	1
7 Potts, W. W.....	T. H. Howard	200	1	45	2	6	1	1	1	1	1	1	1
8 Smith, Jno. W.....	W. E. Seaton	40	1	1	1	1	1	1	1	1	1	1	1
9 Viets Mine.....	A. Carson	235	1	35	2	4	1	1	1	1	1	1	1
Totals		1,065	6	3	1	1	1	5	2	1	6	4	1

COAL MINES—Continued.

COUNTY.

Pillar and Long-wall room	No. of kegs	Cost to miner...	Miles em- ployed...	Employees.			Prices paid for mining.	Tons of coal mined Run of mine...	Price receiv'd per ton at mine.	Lump coal.	Office number..... Amount received for product.....
				Miners	Others	Total.					
				8	4	12	\$1 00	\$1 00	1,400	\$1 50	\$2,100
				25	15	40	1 25	1 25	6,000	1 75	10,500
				12	6	18	1 00	1 00	2,400	1 75	4,210
				10	2	12	1 26	1 00	1,239	1 80	2,230
	25	\$56 50	10 8	243	213	456	1 00	1 00	79,588	1 50	119,000
				7	2	9	1 00	1 00	1,445	1 50	2,167
6	25	\$56 50	10 8	305	242	487			92,022		\$1 52
											\$140,207

COUNTY.

1	1	1	1	4	2	1	1	5	3	\$1 25	\$1 00	\$2 00	\$1,400
1	1	1	1	3	2	1	1	4	3	1 00	87½	2 00	910
1	1	1	1	7	4	2	2	9	6			2 00	\$2,810

COUNTY.

1	1	1	1	1	1	1	1	2	1	\$1 00	50	80	\$1 50	\$120	
1	1	1	1	6	6	211	148	17	12	228	160	50	71,755	64,560	
1	1	1	1			4	2	2	6		70		90	560	
1	1	1	1			2		2		1 00		100	1 25	712	
1	1	1	1			2		2				1 12½		112	
1	1	1	1	4,039	\$7,058 25	11 9	184	174	42	38	226	212	50	112,582	5
1	1	1	1	1,211	2,119 25	12 5	187	39	40	18	177	57	50	37,170	301,060
1	1	1	1	6,444	11,277 00	15 16	231	244	60	55	291	299	50	151,308	7
1	1	1	1	300	525 00	5 5	68	20	20	88	88	60	60	25,000	27,500
1	1	1	1	1,700	2,975 00	9 9	250	180	45	40	295	220	50	74,230	69,592
1	1	1	1	10	11 50	1 1	1	1	1	1	75	65	200	1 00	200
1	1	1	1			2		1		3		1 12½		200	
1	1	1	1			2		1		3		1 00	1 50	300	
1	1	1	1			2		1		3		50	250	402	
1	1	1	1	900	1,575 00	6 5	95	75	10	8	105	83	50	46,224	44,900
1	1	1	1	14,604	25,541 00	65 55	1188	929	239	191	1427	1120		519,649	509,458

COUNTY.

1	1	1	1	6	3	1	1	7	4	75	75	886	\$1 25	
1	1	1	1	2	1	1	1	2	1	75	75	300	1 50	\$1,109
1	1	1	1	25	25	5	5	30	30	80	70	9,550	1 20	450
1	1	1	1	33	29	6	6	39	35			10,736	1 21	11,462
1	1	1	1											13,021

COUNTY.

1	1	1	1	4	1	1	4	1	1	\$2 00	\$1 50	485	\$2 50	\$1,087
1	1	1	1	3	1	1	3	2	1	200		337	2 50	838
1	1	1	1	4	1	1	5	2	1	25		468	2 00	936
1	1	1	1	2	1	1	2	2	1	200		200	2 50	500
1	1	1	1	6	4	1	6	4	2	200		600	2 50	1,500
1	1	1	1	4	2	1	4	2	2	225		250	2 50	625
1	1	1	1	8	2	1	8	2	1	25		1,480	2 12½	3,145
1	1	1	1	2	1	1	2	2	1	200		100	2 50	250
1	1	1	1	41	4	2	1	10	5	1 00	1 00	2,195	2 00	4,390
1	1	1	1	41	11	3	1	44	12			6,065	2 18	13,271

STATISTICS OF

PUTNAM

Mine number.	Name of company or mine owner.	Name of operator.	No. of days worked.	Kind of opening	Kind of power.	How ventilated	Diameter of fan		
							Fan Furnace	Natural	Electricity
1	Anders, Jefferson	Jefferson Anders	120	1		3	6	1	1
2	Adkins, Wm.	Wm. Atkins	60	1		27	2	1	1
3	Bass, W. H. (Peacock M.)	Wm. H. Bass	90	1		4		1	1
4	Emporia Coal & Coke Co.	Emporia Coal & Coke Co.	127	1		110	3	1	
5	Leck Jno.	Jno. Leck	90	1		4		1	1
6	Lizzie Mine	W. and J. Rodgers	160	1		3		1	1
7	Blackbird Coal Co.	Wm. Love	135	1		53	2	10	1
8	McFatridge, J. C.	J. C. McFatridge	20	1		3		1	1
9	Mendota Coal & M. Co.	Mendota Coal & M. Co.	155	1		67	2	10	1
10	North Mo. Block Coal Co.	North Mo. Block Coal Co.	165	1		3		1	1
11	Vandyke, Mrs. Ellen	Mrs. Ellen Vandyke	60	1		3	4	1	1
12	Veach, Roy	Jas. Cain	100	1		4		1	1
Totals			1,282	4	2	6	3	1	8
							6	5	2

RALES

1	Atkinson, Jno. A.	Jno. A. Atkinson	20	1	1	1	10	1	1	-
2	Rails Co. Coal Co.	Rails Co. Coal Co.	190	1		40	2	2	1	1
3	Standard Coal Co.	A. L. Stapleton	100	1		2	4	1	1	-
Totals			310	1	2			1	2	-

RANDOLPH

1	Bradley, D. T.	D. T. Bradley	175	1		60	4	1	1	12
2	Breckenridge, John	John Breckenridge	160	1		70	4	1	1	12
3	Brown & Welsby	Brown & Welsby	110	1		65	3	4	1	1
4	*Caffery & Baker Coal Co	Caffery & Baker Coal Co.	100	3		4	3		3	
5	Eagle Coal Co.	Eagle Coal Co.	211	1		125	4	1	1	
6	Davis & Jones	Davis & Jones	140	1		96	4	1	1	
7	Dean, Henry	Henry Dean	120	1		4		1	1	
8	Edwards, Emanuel	Emanuel Edwards	90	1		4		1	1	
9	Elliott Mine No. 3	Elliott Coal Co.	175	1		245	4	1	1	12
10	Enterprise Coal Mine	Jno. Cronan & Co.	112	1		110	3	8	1	1
11	Gibons, Adam	W. M. Breman	200	1		4		1	1	
12	Headrick, Jas.	Boone & Graves	240	1		4		1	1	10
13	Higbee Coal & Mining Co	Wm. Walton	155	1		175	3	8	1	10
14	Hedrick & Moore	Hedrick & Moore	250	1		90	4	1	1	10
15	Interstate Mining Co.	Wm. Walton, Sup't	154	1		110	3	8	1	12
16	McCann, Hugh	D. W. Skinner	100	1		4		1	1	
17	Millburn, Joseph	Millburn & Sons	120	1		50	4	6	1	1
18	Mitchell & Co., W. E.	W. E. Mitchell & Co	176	1		4		1	1	
19	Morris, Jno. L.	Jno. L. Morris	190	1		3	8	1	1	
20	O'Toole, Joseph	Joseph O'Toole	95	1		4	3	1	1	
21	Robinson, Jas. F.	Jas. F. Robinson	276	1		4	2	1	1	
22	Rutherford, W. T.	W. H. McKeernan	244	1		3	10	1	1	
23	Stewart, J. N.	Samuel Routt & Co.	140	1		4		1	1	
24	Strieff, Michael	Michael Strieff	175	1		4		1	1	
25	Vaughn, Wm.	Wm. Vaughn	30	1		4	6	1	1	
26	Williams, J. B.	L. B. Williams	120	1		96	4	2	1	1
27	Wlard, Harry	Harry Ward	125	1		88	3	10	1	1
28	Sml.									
29	Viets Mals		4,184	13	8	8		10	9	19
Totals										

Huntsville Coal Company

NES—Continued.

Y.

Order used.	Employees.			Prices paid for mining.		Tons of coal mined...	Price receiv'd per ton at mine,	Offce number..... Amount received for product.....			
	Miners	Others	Total	Summer	Winter						
				Summer	Winter						
	2	1		2	1	85	70	\$1 25 \$615			
	2	1		2	1	75	80	1 25 100			
	6	1	14	6	6	\$1 00	550	1 25 887			
1	1	31	14	2	1	83	15	3,394 \$1 15 4,524			
	6	2		8		80	700	1 12½ 787			
	10	6	8	1	13	7	90	3,200 1 10 3,520			
2	1	25	15	4	2	29	17	4,150 1 44½ 5,936			
	3					87½	55	1 12½ 62			
10	9	234	180	47	42	281	222	66,731 1 16 77,558			
1	1	12	9	2	1	14	10	8,442 1 15 113			
	2					90	70	100 1 12½ 3,950			
	9				9	1 00		1,600 1 25 2,000			
	14	12	340	225	61	47	401	272			
								85,032 1 17 100,112			

Y.

			1	25	25	2	2	27	27	87½	86	86	88	\$1 50			\$57	1
				5	5	1	1	6	6		86		950	1 23	1 28		10,646	2
																	1,222	3
																		11,925

Y.

0	\$1,050 00	5	5	75	50	14	14	89	64	50	50	19,000	1 00			19,000	2
0	1,100 00	12	12	175	175	20	20	195	195	50	50	30,525	1 00			1,300	3
1	287 00			8	4	3	2	11	6	70	70	3,212	1 08			3,489	5
0	210 00	1	1	30	25	2	2	32	27	70	70	10,000	95			9,500	6
2	24 00			2	2			2	2	75	75	500	1 00			500	7
								3	3	75	75	190	1 25			237	8
				8	8	165	165	37	37	202	202	71,550	1 24			88,555	9
2	201 60			12	6	1	1	13	7	70	70	2,000	1 12½			2,210	10
0	35 00			2	2			2	2	70	70	600	1 00			600	11
6	25 60			4	3			4	3	65	50	2,000	1 00			2,000	12
0	1,000 00	5	4	74	71	22	19	96	90	80	75	33,245	1 10			36,600	13
0	22 2	2	2	80	30	5	5	35	35	50	50	15,000	90			13,500	14
0	20 00	3	3	70	60	7	7	67	60	75	75	28,362	1 16			32,901	15
0	20 00			3	1			3	1	75	75	400	1 10			440	16
4	28 00			3				3		75	75	700	1 50			1,050	17
0	105 63	1	1	6	2	2	1	8	3	70	70	1,904	1 15			2,189	18
0	21 00	1	1	4	2	1		5	2	75	75	882	1 00			882	19
0	17 50			3	0			3	0	75	75	280	1 00			280	20
0	10 50	1	1	4	2	1	1	5	3	70	70	1,600	1 25			2,000	21
5	49 00			4	3			4	3	70	70	1,831	1 10			2,015	22
5	37 50			7				7		70	70	2,000	1 00			2,000	23
6	60 00	1	1	1	1			1	1	70	70	400	1 50			600	24
1	2 00			2				2		78		90	1 00			90	25
4	21 00			3	1			3	1	70	70	423	1 12½			475	26
2	24 00			2				2		70		350	1 25			438	27
0	4,328 70	41	20	696	612	116	111	812	728			230,194	1 11			255,626	

STATISTICS OF

RAY

Office number.....	Name of company or mine owner.	Name of operator.	No. of days worked.	Diameter of fan.....			
				Fan	Furnace	Natural	Electricity
1	Bissell Coal Co.	Good, Mason & Co.	60	1	1	1	1
2	Black Diamond Mine.	Douglass & Izett	170	1	1	1	1
3	Bryan & Co.	Bryan & Co.	102	1	1	1	1
4	Climax Mine.	Charles J. Johnson	75	1	156	10	1
5	Flag, R. A.	H. A. Dickson & Son	80	1	95	2	1
6	Hayson & Humble.	Hayson & Humble	170	1	85	2	1
7	Hubbell, Hyatt & Hubbell	Hubbell, Hyatt & Hubbell	60	1	110	3	1
8	Hubbell & Fisher Coal Co	Hubbell & Fisher Coal Co.	75	1	110	3	1
9	Huston, Joseph.	Fred Huston	230	1	2	1	1
10	Kansas & Texas Coal Co.	Kansas & Texas Coal Co.	71	1	70	1	1
11	King, R. A.	J. W. Sterns	50	1	1	1	1
12	Lockwood-Lusk Coal Co.	Lockwood-Lusk Coal Co.	80	1	42	1	1
13	Loeven, Joseph.	Joseph Loeven	25	1	1	1	1
14	Marshall's Mine.	Jno J. McCormendale	52	1	1	1	1
15	Milligan Mine.	Dickson & Stewart	83	1	25	2	1
16	Mosby Bros.' Mine No. 10	Mosby Bros. Mine, No. 10	129	1	1	1	1
17	Mosby M. (S. Dougherty)	John W. McCart	95	1	60	10	1
18	Murray, Jessie.	Jessie Murray	145	1	60	2	1
19	Pence & Anderson.	Pence & Anderson	177	1	80	2	1
20	Pence & Calmer.	Pence & Calmer	250	1	80	2	1
21	Mine No. 11, Richmond.	Jos. Pickering Coal Co.	96	1	107	10	1
22	Rankin, A. F.	A. F. Rankin	66	1	2	1	1
23	Richmond & Camden, No. 1	Richmond & Cam'n, No. 1	140	1	50	10	1
24	" "	" 2	200	1	50	10	1
25	" "	" 3	179	1	55	2	1
26	" "	" 4	174	1	70	2	1
27	" "	" 5	92	1	80	2	1
28	" "	" 9	200	1	95	2	1
29	" "	" 12	138	1	112	3	1
30	Starr, Alex.	Wm. Phillips	40	1	2	1	1
31	The Major Grimes Mine.	James Blair	90	1	190	2	1
32	Whiteman, Josiah.	Whiteman, Josiah	60	1	85	2	1
33	Williams Coal Co.	R. J. Williams	170	1	107	1	1
34	Wilson Coal Co., M. No. 8	Wm. Wilson	.....	1	110	2	1
Totals.....			3824	26	2	6	4
					12	14	7
						5	25

ST. CLAIR

1	Allison, R. W.	R. W. Allison	60	1	3	4	1	1
2	Barnett, Joseph.	A. J. Davis	130	1	2	10	1	1
3	Hoover Mine.	Henry Willcox	140	1	2	6	1	1
4	Klternin, J.	Wm. Howard	40	1	2	1	1	1
5	Short, J. D.	J. D. Short	90	1	3	2	1	1
6	Thompson Mine	Wm. Hines	60	1	1	3	1	1
7	Vista Coal Mine.	D. L. Douthat	140	1	50	3	1	1
8	Watkins, Wm.	Wm. Watkins	60	1	2	8	1	1
Totals.....			720	1	5	1	1	1

SALINE

1	Hyem, J.	John Highly	90	1	1	6	1	1
2	Taylor, Henry	Henry Taylor	78	1	52	10	1	1
Totals.....			168	1	1	1	1	2

COAL MINES—Continued.

COUNTY.

Powder used.	Miners employed.	Employees			Prices paid for mining.	Tons of coal mined	Office number.....	
		Miners	Others	Total.			Run of mine	Lump coal.
		Winter.....	Summer.....	Winter.....			Run of mine	Price receiv'd per ton at mine.
Pillar and room.....	No. of kegs	Cost to miner.....	Summer.....	Winter.....	Summer.....	Winter.....	Run of mine	Price receiv'd per ton at mine.
Long-wall.....		Cost to miner.....	Summer.....	Winter.....	Summer.....	Winter.....	Run of mine	Price receiv'd per ton at mine.
1	1	1	20	22	22	22	1,208	1,510
1	1	5	1	1	87 1/2	87 1/2	1,044	1,570
1	1	5	2	1	1 12 1/2	1 12 1/2	500	800
1	1	2	1	4	1 12 1/2	1 12 1/2	300	600
1	1	2	2	4	87 1/2	87 1/2	172	258
1	1	5	3	5	87 1/2	87 1/2	1,650	2,887
1	1	45	33	48	87 1/2	87 1/2	4,490	5,612
1	1	30	2	32	87 1/2	87 1/2	2,000	2,500
1	1	4	4	4	1 25	1 25	1,840	1,75
1	6	96	40	22	118	51	87 1/2	3,220
1	1	2	2	2	1 25	1 25	21,864	32,796
1	1	60	3	63	87 1/2	87 1/2	204	357
1	1	3	1	4	1 00	1 00	6,000	7,800
1	1	2	1	2	1 00	1 00	150	260
1	1	2	1	3	1 00	1 00	228	446
1	1	3	1	3	1 00	1 00	287	500
1	1	5	3	6	1 00	1 00	373	565
1	1	5	2	6	87 1/2	87 1/2	754	1,036
1	1	15	3	18	87 1/2	87 1/2	1,000	1,500
1	1	24	12	26	87 1/2	87 1/2	3,206	5,610
1	1	37	4	46	87 1/2	87 1/2	7,554	9,443
1	2	1	40	8	87 1/2	87 1/2	7,811	10,466
1	1	2	61	44	12	75	4,217	5,271
1	2	1	39	2	1	42	75	23
1	3	2	49	34	8	57	87 1/2	24
1	4	3	79	54	10	6	87 1/2	25
1	3	2	60	32	6	5	87 1/2	27
1	1	1	22	2	2	24	87 1/2	28
1	1	27	20	4	31	23	87 1/2	29
1	1	2	2	2	2	1 25	89	2 00
1	1	2	2	2	2	1 00	250	178
1	1	4	1	4	1	87 1/2	350	30
1	1	20	1	1	21	1	87 1/2	500
1	2	1	30	15	1	31	87 1/2	450
33	1	31	16	805	294	115	55	149,093
								13 9
								207,704

COUNTY.

1	10	\$16.50	2	2	2	\$1 00	160	\$1 50	\$240	1
1			2	2	4	2 1 00	390	1 25	487	2
1			1	5	6	80	700	2 00	1,400	3
1			2	1	2	1 80	448	1 25	560	4
1			2	2	2	1 00	270	1 25	338	5
1			8	6	1	9 7 80	1,700	2 00	480	6
1			2	1	2	1 1 25	150	1 37 1/2	2,335	7
7	10	16.50	21	12	7	1 28 13	4,058	1 62 1/2	244	8

COUNTY.

1	1	1	1	1	1	\$1 25	120	\$2 50	\$300	1
1			3	1	3	1 25	312	2 00	624	2
2			4	1	4	1	432	2 14	924	

STATISTICS Q

SCHUYLER.

Name of company or mine owner	Name of operator.	Diameter of fan.....	Fan.....	How ventilated
Kind of power.	Kind of power.	Steam.....	Natural gas.....	Furnace.....
Thickness of coal seam, inches.	Depth of shaft.....	4 feet.....	Electricity.....	Hand.....
Kind of opening.....	Kind of shaft.....	Brick pit.....	Electric motor.....	Steam engine.....
	Britt.....	Brick.....	Electric motor.....	Steam engine.....
	Rope.....	Rope.....	Electric motor.....	Steam engine.....
	Shaft.....	Shaft.....	Electric motor.....	Steam engine.....
Franklin Mine	Sam'l H. Taylor	90	I	1
Golson, Ira	Ira Gibson	90	L	1
Haven Coal & Mining Co. Wright, Geo	J. J. Mock	150	L	1
	Geo. Wright	90	I	1
Totals .....	.....	415	3 L, I	3 1

VERNON

Allen, L.	Edward Green	150	L	4		
Arthur Coal Mining Co.	Arthur Coal Mining Co.	200	L	5		
Bedford Coal Co.	Brown Bros.	150	L	5		
Burks, Margaret	Edwin Goss	50	L	5		
Burton, W. C.	J. C. Lucas	60	L	1	2	
Central C. & C. Co. No. 7	Central C. & C. Co. No. 7	50	L	13	4	8
" " "	" " "	150	L	15	4	10
Crawford, C. B.	C. B. Crawford	40	L	5		
Dodson, J. N. B.	J. N. B. Dodson	40	L	5		
Ewing, Milton	Ewing Bros.	50	L	5		
Gordon, A. A.	John Blair	50	L	5		
Hamilton, Mrs. Margaret	Mrs. Margaret Hamilton	50	L	5		
Larkins Coal Co.	Larkins Coal Co.	50	L	5		
Mann, Morris	Morris Mann	50	L	5		
Prewitt, W. H.	W. H. Prewitt	50	L	5		
Pritchard, Wm. M.	Withrow & Campbell	50	L	5		
Rich Hill C. & M. Co. No. 16	Rich Hill C. & M. Co. No. 16	170	L	4	1	
" " " " " 17	" " " " " 17	150	L	4	1	
Shamboltner, B.	B. Shamboltner	40	L	5		
Smith, Peter	Peter Smith	50	L	5		
" "	Seymour & Thompson	50	L	5		
Stoll, John	L. McL.	20	L	5		
Sucker, J. J.	J. J. Sucker	50	L	5		
Vernon Coal & Mining Co.	Vernon Coal & Mining Co.	100	I	5	5	
Wright, J. D.	J. D. Wright	50	L	5		
Totals		2,052	5	2	18	

COAL MINES—Continued.

COUNTY.

Powder used	Mules em- ployed.	Employees.			Prices paid for mining.			Tons of coal mined.	Price receiv'd per ton at mine.	Lump coal.	Run of mine	Office number..... Amount received for product.....
		Miners	Others	Total.	Summer	Summer	Winter					
		Winter	Summer	Winter	Winter	Summer	Winter					
Pillar and room	No. of kegs	Cost to miner...	Winter...	Summer...	Winter...	Summer...	Winter...					
Long-wall.....	4	3	17	2	2	19	2					
	1	1	2	1	2	75	75	320	\$2 00	\$640	1	
	1	1	1	1	2	100	100	150	2 00	300	2	
	1	1	10	1	11	75	75	1,370	1 25	1,712	3	
	1	4	2	4	2	75	75	600	1 25	750	4	
	4	3	17	2	2	19	2					
								2,440	1 40	3,402		

COUNTY.

	600	600 00	14	14	1	1	2	3	536	\$1 25	\$600	1			
1	520	910 00	7	7	50	50	20	20	6,880	1 03	7,085	2			
							3	53	22,000	85	18,700	3			
							2	50	86	1 25	107	4			
							2		320	1 25	400	5			
	1,292	2,907 00	9	8	29	29	23	22	51	50	22,869	1 15	26,299	6	
	1,250	2,812 50	4	4	25	20	17	15	42	35	40	23,717	1 15	27,274	7
1	40	70 00					18	13	13	13	45	654	1 15	752	8
							1	2				127	1 75	224	9
							2	2				128	1 75	226	10
	4	7 00					3	3				400	1 75	700	11
5	8 75	1					1	1				400	1 50	600	12
							1	1				114	1 70	200	13
							2	2				120	1 75	210	14
							2	2				200	1 75	350	15
							2	2				360	1 75	680	16
							2	2				200	1 75	350	17
1	2,786	2,786 00	6	6	55	47	11	9	66	56	45	58,847	88	50,853	18
1	5,676	5,676 00	9	9	79	73	12	10	91	83	45	113,678	87	94,376	19
							5	5				400	1 25	500	20
							5	5				560	1 25	700	21
							4	4				750	1 25	987	22
							4	4				150	1 25	188	23
							2	2				120	1 20	144	24
1	3,000	5,250 00	12	12	85	85	12	12	97	97	45	500,000	85	42,320	25
							2	2				270	1 50	405	26
7	15,173	21,027 25	65	60	324	304	158	104	482	408		303,886	90	275,180	

ANNUAL REPORT OF THE

Table III—Showing rank of coal producing counties in order of production for each of past six years.

No.	Counties counties	1891.		1892.		1893.		1894.		1895.		1896.		Average product for six years.....
		Rank..	Product, tons.											
1	Bates	1	826,283	2	659,924	4	627,514	4	291,271	3	252,231	2	375,300	488,752
2	Macon	2	454,029	1	685,335	1	788,563	1	511,566	1	539,120	1	519,649	583,048
3	Lafayette	3	352,603	3	347,600	3	371,928	2	296,931	2	256,761	3	307,296	323,518
4	Ray	4	282,247	5	272,948	4	319,405	6	196,852	6	150,998	6	149,083	223,950
5	Randolph	5	224,758	4	297,011	6	219,762	5	209,656	5	218,774	5	230,194	233,359
6	Henry	6	144,139	6	137,258	8	125,962	8	84,473	9	98,058	9	78,561	111,573
7	Putnam	7	123,526	7	134,984	7	145,641	7	119,832	7	111,572	8	85,032	120,098
8	Vernon	8	64,303	8	119,056	5	234,376	3	297,599	4	237,965	4	303,866	209,527
9	Barton	9	63,026	9	108,784	9	61,301	10	55,767	10	76,242	12	37,570	67,115
10	Grundy	10	28,983	13	28,670	12	35,770	12	35,000	12	37,200	10	41,000	34,437
11	Linn	11	28,036	11	35,588	10	48,302	9	71,807	8	100,179	7	92,022	62,655
12	Boone	12	23,577	14	21,058	14	25,602	17	19,038	14	21,090	15	20,428	21,789
13	Caldwell	13	22,981	10	38,333	13	29,020	14	22,869	16	17,876	16	19,780	25,080
14	Andrain	14	19,569	12	29,793	11	42,262	11	43,910	11	40,918	11	37,611	35,677
15	Adair	15	17,110	17	14,820	16	20,957	15	20,744	13	24,640	13	23,510	20,280
16	Callaway	16	16,591	15	16,651	16	23,961	13	23,223	16	18,771	14	22,182	20,045

Counties for the Year Ending June 30, 1895.

COUNTY.

Non-fatal.....	Fatal.....	Insured?	Am't of Insurance No..	Nature of accident.	Coroner's verdict.
				Fall of roof	
1	1	1	\$1,000	Fall of roof	
1	1	1		" "	
2	2	2			

COUNTY.

....	1	1	Overcome by powder smoke	Suffocation by powder smoke.
------	---	------	---	------	--------------------------------	------------------------------

COUNTY.

1	1	1	1	Cage lowered too rapidly	
1	1	1	\$1,000	Explosion	Explosion; too rapid shooting.
1	1	1		" "	
1	1	1		Cage lowered too rapidly	Accidental.
1	1	1		Crossing shaft bottom	No inquest.
1	1	1		Explosion	Death from asphyxiation.
1	1	1		" "	No inquest.
1	1	1		Caught by mine car	
4	6	1	9	\$1,000	

COUNTY.

....	1	1	Fall of roof	No inquest.
------	---	------	---	------	--------------------	-------------

COUNTY.

1	1	1	1	Fall of roof	
1	1	1	\$9 pr w	Caught by cage	
1	1	1		Fall of coal	
1	1	1		Caught by car	
4	1	3			

ANNUAL REPORT OF THE

ACCIDENTS BY

MACON

Name of company or operator.	Name of injured employe	Occupation.	Age	Single	Married	No. of children...
Kansas & Texas Coal Co.	Busilina, Joseph	Miner	30	1		
" "	Davis, Daniel	"	30	1		
" "	Davis, A. B.	"	27		1	
" "	Floyd, Irvin	"	40	1		
" "	Clay, Wm.	"	22	1		
" "	Yager, Jno.	"	30		1	
Little Pittsburg Coal Co.	Raw, Tony	"	19	1		
" "	Smith, Wm. A.	Road man	32		1	1
Totals.....				5	3	1

PUTNAM

Mendota Coal & Mining Co.	Cox, John Z.	Miner	24	1		
" "	Smith, Jno. W.	"	24	1		
" "	Welsh, F. J.	"	26	1		
Totals.....					3	

RANDOLPH

Elliott Coal Co.	Dien, Gustavus	Miner	40	1		
" "	Lewis, Thomas	"	30	1		
Totals.....					2	

VERNON

Central Coal & Coke Co.	Brown, Anton	Miner	34		1	
" "	Charon, Cornelius	"	32	1		
" "	Jones, Frank	"	55	1		
" "	Keegan, Geo.	"	28	1		
" "	Smith, John X.	"	27		1	3
Totals.....				3	2	3

COUNTIES—Continued.

COUNTY.

Non-fatal Fatal	Insured? Yes	No.	Amt' of Insurance	Nature of accident.	Coroner's verdict.
1	1	1		Fall of roof	
1	1	1		"	
1	1	1		Premature blast	
1	1	1		Fall of roof	
1	1	1		"	
4	4	8			

Accidental; his own carelessness.
No inquest; injured internally.

By falling of rock in his room.
Death by fall of rock.

COUNTY.

1		1		Fall of roof	
1		1		Fall of coal	
1		1		Struck roof while riding mine car	
3		3			

COUNTY.

1		1		Fall of roof	
1		1		"	
2		2			

COUNTY.

1		1		Fall of roof	
1		1		"	
1		1		Caught by cage	
1		1		Fall of roof	
1	4	5			

Accidental.
No inquest; thought unnecessary.
Accidental; no one to blame.
Accidental death.

TABLE X.—Cause of accidents and number injured from each cause.

	Fatal	Non-fatal	Total
Asphyxiation.....	1	.....	1
Blasts.....	.....	1	1
Coal—fall of.....	.....	1	1
Cars—mine.....	.....	2	2
Explosions.....	4	.....	4
Cages—caught by.....	2	4	6
Fall of roof.....	12	9	21
Totals.....	19	17	36
<i>Accidents by counties.</i>			
Adair.....	.....	2	2
Barton.....	1	.....	1
Bates.....	6	4	10
Henry.....	1	.....	1
Lafayette.....	.....	4	4
Macon.....	4	4	8
Putnam.....	.....	3	3
Randolph.....	.....	2	2
Vernon.....	4	1	5
Totals.....	16	20	36

TABLE XI.—Recapitulation of accidents.

Number of non-fatal accidents.....	2€
Number of fatal.....	1€
Total.....	3€
Number of single men fatally injured.....	1€
Number of married men fatally injured.....	€
Total.....	16
Number of wives made widows.....	13
Number of children made fatherless.....	8
<i>Employment of injured men.</i>	
Dumper.....	1
Truckman.....	1
Water bailer.....	1
Trappers.....	2
Shot-firers.....	5
Miners.....	26
Total.....	36

LIST OF PROPRIETORS AND OPERATORS.

ADAIR COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Madden, J. F.....	J. F. Madden.....	Novinger
O. K. Coal Co.....	J. F. Stroup	"
Scott, D. C.....	D. C. Scott.....	Kirksville.....
Stahl Coal Mine	H. C. McCahan	"

AUDRAIN COUNTY.

Atkins, D. J.....	D. J. Atkins	Worcester
Davis, C. C.....	Davis, Reynolds & Roach	Mexico
Detienne, Albert	Albert Detienne	Mt. Carmel
Lynch, Jas	D. M. McDonald	Laddonia
McGuire, Mrs. Martha	Samuel McGuire	Martinsburg
Taylor & Co	Taylor & Co	"
Turpin, Ferris & Co	C. N. Turpin	Laddonia
Vandalia Coal Co.....	Vandalia Coal Co	Vandalia
Vandalia Fire Brick Co	Vandalia Fire Brick Co	"
Waddington Coal Co	Waddington Coal Co	Mexico

BAERTON COUNTY.

Allen, F. L.....	F. L. Allen	Liberal
Bell, J. W.....	J. W. Bell	Lamar
Betz, Jacob	Betz & Brenogle	Liberal
Boneware Bros	John H. Lavery	"
Cameron, J. C.....	N. W. Wilhelm	"
Carr, W. T.....	W. T. Carr	Lamar
Hanshaw, W. H.....	Thos. Williams	Liberal
Joyce, A. H.....	Wm. Williams	Boston
Lanyon, S. H.....	S. H. Lanyon	Minden Mines
Mann, B. F.....	Campbell & Stith	Lamar
Miller, A. J.....	A. J. Miller	"
Prosser, John J.....	John J. Prosser	Liberal
Spear, M. M.....	M. M. Spear	Lamar
Still, W. H. and J. A.....	W. H. and J. A. Still	Boston
The Wear Coal Co	The Wear Coal Co	Topeka, Kan
Travis, John	John Travis	Liberal
Van Pelt, Chas	C. C. Daubin	Lamar
Waltman, Henry	J. H. Waltman	"
Walser, G. H.....	Thos. Cox & Co	Liberal
Walser, G. H.....	W. R. Colby	"
Whitesell, H. J.....	H. J. Whitesell	"

BATES COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Bearslot, F. M.	Runey & Heathery	Worland
Borrow Bros.	Borrow Bros.	Rich Hill
Bovard, J. H.	J. C. Flansburg	Amsterdam
Boyce & Ferguson	Sullivan & Miller	Rich Hill
Brayton & Russell	J. D. Rowland	Amoret
Bruce & Rees Coal Co.	Bruce & Rees Coal Co.	Rich Hill
Dabney, E. C.	E. C. Dabney	Foster
Doolittle, John	John Doolittle	"
Gailey, & Brown	C. W. Field	Amoret
Gauf, J. M.	J. M. Gauf	"
Griggs, J. C.	J. C. Griggs	Shobe
Hudson, L. G.	L. G. Hudson & Co.	Worland
Kansas Line Coal Co.	C. T. Seaver	Foster
Kansas Line Coal Co.	Kansas Line Coal Co.	"
Lewis, O. H.	Jno. Gerodo	"
Martin & Gee	Martin & Gee	Rich Hill
Missouri and Kansas Land Co.	D. D. Peeler	Rockville
Nickel, John	John Nickel	Amsterdam
Pearson, Peter	Peter Pearson	Rich Hill
Philadelphia Construction Co.	J. J. Riddle	Amoret
Rich Hill C. & M. Co. Mine No. 15	Rich Hill Coal & M. Co.	Rich Hill
Rich Hill C. & M. Co. Mine No. 18	" "	"
Rich Hill C. & M. Co. Mine No. 19	" "	"
Rich Hill Coal and Mining Co.	David Rees	"
Tatley, J. M.	J. M. Tatley	Worland
Rankin Bros.	Rankin Bros.	"
Washburn, Henry	Henry Washburn	"
Young, Geo.	Geo. Young	Foster

BOONE COUNTY.

Blackfoot Coal Co.	W. A. Gooding	Columbia
Buckley, H. T.	Geo. Bryant	Rucker
Carter Bros.	Carter Bros.	Columbia
Columbia Coal Co.	Columbia Coal Co.	"
Gordon, S. D.	S. D. Gordon	"
Gossett, Jno. F.	Jno. F. Gossett	"
Harris, J. L.	J. L. Harris	"
Quitten, L.	L. Quitten	"
Kogers Bros.	Geo. Rogers	Brown's Station
Rummonds, Sam'l.	Sam'l Rummonds	Columbia
Stidham, W. A.	W. A. Stidham	Harrisburg
Stone, J. W.	J. W. Stone	Perche
Sublett, S. T.	S. T. Sublett	Columbia
White & Co.	White & Co.	Rucker
Zarring, N. B.	N. B. Zarring	Columbia

CALDWELL COUNTY.

Caldwell Coal Co.	Caldwell Coal Co.	Hamilton
Kingston Coal Co.	Kingston Coal Co.	Kingston

CALLAWAY COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Valley mine.....	J. W. Simmons	Fulton.....
Wm.....	Wm. Castle.....	"
Edwin.....	Massey & Russell.....	"
Fire Brick & M. Co	Fulton F. B & M. Co.....	"
John.....	John Harris.....	"
koff, Jno.....	Jno. Marsenkoff.....	"
James.....	Jas. Smith.....	"
R. F	R. F. Thorpe.....	"
W. C.....	W. C. Weeks.....	Hams Prairie.....

CARROLL COUNTY.

Henry	Henry Brooks	Carrollton
nan mine	Geo. W. Williams	"
gham, J. B	M. Kirkman.....	Wakenda
Ralph	Ralph Farr	Little Compton
s, Wm.....	Wm. Hughes	"
W. F.....	w. F. Ogle	"
ds, W. F	W. F. Reynolds	"
W	W. Scott	Carrollton
lead, Jas.....	Jas Whitehead	Hale
son, H. H.....	H. H. Wilcoxson	Carrollton

CASS COUNTY.

D. W	D. B. Wallis.....	Creighton
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CEDAR COUNTY.

, N. J.	M. M. Anderson	Lebeck
mine.....	Jos. M. Conner	Jerico
n, J. C.....	J. C. Duncan	"
r, Isaac	John Moore	"
d, J	J. M. Bridgewater	"
Geo. M	Geo. M. Poague	"
der, C. M.....	C. M. Schroeder	EdDorado Springs
, J. H.....	J. H. Young	Filley

CHARITON COUNTY.

n, Louis.....	Green Taylor	Dalton
F.....	A. F. Isle	Indian Grove
W	R. W. Isle	"
, Valentine.....	V. Kahler	New Comer

CLAY COUNTY.

ri City Coal Co.....	Missouri City Coal Co.....	Kansas City
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COOPER COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Hazell, Chas W.....	C. W. Hazell	Boonville
Jenkins, H. W.....	H. W. Jenkins.....	"
Missouri Valley Coal Co.....	C. E. Andrews.....	"

DADE COUNTY.

Allen, Wm.....	Thos. Allen.....	Sylvania
Farmer, J. H.....	J. H. Farmer.....	"
Finney, W. S.....	W. S. Finney.....	"
Gardner, W.....	T. H. Gardner.....	"
McCluey, Robt.....	R. McCluey.....	"
Neal, Jno. H.....	Jno. H. Neal.....	"
Seaton, J. R.....	W. E. Seaton.....	"
Star mine.....	L. Waterbury.....	"

GRUNDY COUNTY.

Bailey, C. Tom.....	Bailey, C. Tom.....	Trenton
Grundy County Coal Co.....	Grundy Co. C. Co.....	Gault

HENRY COUNTY.

Barth, John.....	S. B. Price.....	Lucas.....
Braun Coal Co.....	Edward Braun.....	Deepwater.....
Central Coal and Coke Co.....	Central Coal & Coke Co.....	Kansas City.....
Clark, David.....	Robt. L. Hess.....	Montrose
Co-operative Coal Co.....	Co-operative C. Co.....	Lewis Station.....
Colorado Coal Shaft No. 3.....	D. C. Blanchard & Son.....	Brownington
England, Wm.....	Wm. England.....	Clinton
Gearhardt, Theo.....	T. Gearhart.....	Sparrow
Hines mine.....	J. W. Shook.....	Windsor
Hughes, W. E.....	W. E. Hughes.....	Windor
Hurst, John.....	Jno. Hurst.....	Deepwater.....
McFadden, H. B.....	H. B. McFadden.....	Deepwater.....
McLeod, mine.....	Griffith & Nichols.....	Clinton
Marvin, Mrs. A.....	J. L. Arnold.....	Montrose
Miller, W. J.....	L. W. Beaman.....	Windsor
Moberly, J. W.....	J. W. Moberly.....	Piper
Morris & Bogard.....	Morris & Bogard.....	Clinton
Pigg, D. B.....	D. B. Pigg.....	Lewis Station
Ralls, J. D.....	J. D. Ralls.....	Montrose
Reese, Wm.....	Wm. Reese.....	Deepwater
Rusk, Wm.....	Wm. Rusk.....	Deepwater
Rustler mine.....	S. Mantle & Son.....	Brownington
Stockton Bros.....	Stockton Bros.....	Clinton
Thompson & Co. R. L.....	R. L. Thompson & Co.....	Brownington
Thompson & Co. R. L.....	R. L. Terrill.....	Brownington
Tebo Coal Co.....	Tebo Coal Co.....	Lewis Station
Trimble mine.....	S. R. Johnson.....	Montrose
Vickers, W. W.....	E. E. Trimble.....	Montrose
Victor, S. M.....	John H. Keller.....	Montrose

HOWARD COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Fayette Mining Co..... Lockridge, B. M.....	Fayette M. Co..... B. M. Lockridge.....	Fayette Fayette

JACKSON COUNTY.

Brush Creek Coal & Mfg. Co.....	Brush Creek Coal & M. Co.	Kansas City
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JOHNSON COUNTY.

Meiley, M. B.....	M. B. Meiley.....	Warrensburg
Murley, J. S.....	J. S. Murley.....	Montserrat.....
Thomas, John.....	Thomas & Anthony.....	Warrensburg.....
Thomas, T. B.....	Herrington Bros.....	Bristle Ridge
Wood, B. F.....	B. F. Wood.....	Warrensburg

LAFAYETTE COUNTY.

Alcorn & Son.....	Wm. Alcorn.....	Odessa.....
Armstrong, Joseph.....	Joseph Armstrong.....	Greentown
Bancom, John.....	Jno. Bancom.....	Lexington
Beatty Coal Co., G. B.....	G. B. Beatty Coal Co.....	Higginsville
Beatty & Campbell.....	Beatty & Campbell.....	"
Bell & Greer.....	W. H. Greer	Lexington
Bonanza Coal Co.....	S. W. Brandon.....	Higginsville
Bond, Geo.....	Geo. Bond.....	"
Blackburn Coal Co.....	Fritz Stokes	Blackburn
Carter & Son.....	Carter & Son	Wellington
Clark, Thos.....	Theo. Altschoffel.....	Lexington
Colman, Frank.....	F. Colman.....	Higginsville
Corder Coal Co.....	Corder Coal Co.....	Corder
Consolidated Farmers Coal Co.....	Consolidated F. C. Co.....	Higginsville
Daisy Hill Coal Co.....	W. H. Bell.....	Corder
Dover Coal Co.....	Dover Coal Co.....	Lexington
Duncan, Chas. E.....	Jno. H. Grim.....	Higginsville
Fox, N. F.....	G. Dennis.....	Dover
Gaffin, O. M.....	O. M. Gaffin.....	Lexington
Haygood Coal Co.....	Gunn Bros.....	Higginsville
Hays, Alice B.....	Hays Coal Co.....	Lexington
Holwell, M.....	M. Holwell	"
Hughes, H. C.....	J. W. Hughes	Higginsville
Kresse, A. F.....	A. F. Kresse	Concordia
Kreutz, Fred.....	M. Z. Frazier	Wellington
Lexington Coal & Mining Co.....	Lexington Coal & M. Co.....	St. Louis
O'Malley, Andrew.....	A. O'Malley	Lexington
Osborn, Joseph.....	Jos. Osborn	Anvilville
Osborn, Geo.....	Geo. Osborn	Higginsville
McGrew, J. C.....	J. C. McGrew	Lexington
Macey, Henry.....	H. Macey	Kansas City
Matthews Coal Co.....	Matthews & Strasburg	Mayview

LAFAYETTE COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Missouri River Coal Co.	Mack Warner.	Lexington
Moore, D. J.	D. J. Moore.	Napoleon
Morgan, W. P.	W. P. Morgan	Corder
Norfleet, T. J.	Daggs & Bush	Mayview
Perry, Thos.	Thos. Perry	Bates City
Riley & Keist	Riley & Keist	Lexington
Roswell, J., & Bro.	Jas. Roswell & Bro.	"
Salt Fork Coal & Mining Co.	Salt Fork Coal & M. Co.	Corder
Southwestern Coal Co.	Southwestern Coal Co.	Kansas City
Spruce, Seth	Seth Spruce	Lexington
Strathman, Henry	Geo. Urban	Alma
Seawell, J. M., & Co.	J. M. Seawell & Co.	Kansas City
Summers, W. M.	M. W. Summers	Alma
Thomas, Frank	F. Thomas	Higginville
Walnut Grove mine	J. P. Hendrick	Lexington
Walton, Thos.	Thos. Walton	Conecordia
Waverly Coal & Mining Co.	Waverly Coal & M. Co.	Waverly
Woskoski, M.	M. Woskoski	Higginville

LINN COUNTY.

Bottomly, J. C.	J. C. Bottomly	Brookfield
Brookfield Coal Co.	Brookfield Coal Co.	"
Fifield, Moses	M. Fifield	"
Landrith & Son	Landrith & Son	Marceline
Marceline Coal Co.	Marceline Coal Co.	"
Schaeffer, Bernard	B. Schaeffer	Brookfield

LIVINGSTON COUNTY.

Cox, W. A.	W. A. Cox	Chillicothe
Moorsville Coal Co.	Kobt. Ford	Moorsville

MACON COUNTY.

Baldwin, D. B.	W. H. Phillips	New Cambria
Bevier Black Diamond	Bevier Black Diamond	Bevier
Freele, Wm	Wm. Freele	Macon City
James & Son	James & Son	Bevier
Kansas & Texas Coal Co.	Kansas & Texas Coal Co.	St. Louis, Mo
Little Pittsburg Coal Co.	Little Pittsburg Coal Co.	Lingo
Loomis Coal Co.	R. G. Rombauer, receiver	Bevier
Richmond, J. G.	Campbell & Gorman	College Mound
Terrill R. S.	R. S. Terrill	Macon City
Vese, David	David Vese	Laplata
Watson Coal Co.	W. S. Watson	Bevier

MONTGOMERY COUNTY.

Black Diamond	H. A. Denis	Wellsville
Buoy & Noel	Buford & Noel	"
Fiamond	Vandalia Coal Co.	"

NODAWAY COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Bird, C.....	C. Bird	Quitman.....
Bridges, Thos.....	Thos. Bridges.....	".....
Carpenter, Roy.....	H. Mason & Son.....	Burlington junction.....
Ellenworth, Rufus.....	R. Ellenworth.....	Quitman.....
Martin, H. W.....	William Miller.....	".....
Nichols Bros.....	Nichols Bros.....	".....
Potts, W. W.....	T. H. Howard.....	Burlington junction.....
Smith, Jno. W.....	W. E. Sexton.....	Quitman.....
Vie's mine.....	A. Carson.....	Hughesville.....

PUTNAM COUNTY.

Andrews, Jefferson.....	Jeff Andrews.....	Unionville.....
Adkins, Wm.....	Wm. Adkins.....	Howiand
Bass, Wm. H.....	Wm. H. Bass.....	Zola
Blackbird Coal Co.....	Wm. Love.....	Blackbird
Emporia Coal & Coke Co.....	Emporia C & C. Co.....	Unionville.....
Leck, Jno.....	John Leck.....	Mendota
Lizzie mine.....	W. & J. Rodgers.....	Pearl City Iowa.....
McFatridge, J. C.....	J. C. McFatridge.....	Dean, Iowa.....
Mendota Coal & M. Co.....	Mendota C. & M. Co.....	Mendota
North Missouri B. C. Co.....	North Missouri B. C. Co.....	Pearl City, Iowa.....
Vandyke, Mrs. Ellen.....	Mrs. Ellen Vandyke.....	Grayville
Veach, Roy.....	Jas. Cain.....	Mapleton

RANDOLPH COUNTY.

Bradley, D. T.....	D. F. Bradley.....	Moberly
Breckinridge, Jno.....	John Breckinridge.....	Huntsville
Brown & Welsby.....	Brown & Welsby.....	Renick
Caffery Baker Coal Co.....	Huntsville Coal Co.....	Huntsville
Davis & Jones.....	Davis & Jones.....	Moberly
Dean, Harvey.....	H. Dean.....	Jacksonville
Eagle Coal Co.....	Eagle Coal Co.....	Moberly
Edwards, E.....	E. Edwards.....	Huntsville
Elliott mine No. 3.....	Elliott Coal Co.....	Elliott
Enterprise Coal Co.....	John Cronan & Co.....	Moberly
Gibbons, Adam.....	W. M. Brenan	"
Headrick, Jas.....	Boone & Graves	Higbee
Higbee Coal & M. Co.....	wm. Walton Supt.....	"
Interstate Mining Co.....	Wm. Walton, Supt.....	"
McCann, Hugh.....	D. W. Skinner	Moberly
Millburn, Joseph.....	Millburn Sons.....	Thomas Hill
Mitchell & Co., W. E.....	W. E. Mitchell & Co.....	Huntsville
Morris, Jno. L.....	Jno. L. Morris	Renick
O'Toole, Joseph.....	Jos. O'Toole	Mount Hope
Robinson, Jas. F.....	Jos. F. Robinson	Huntsville
Rutherford, W. T.....	W. H. McKiernan	Moberly
Stewart, J. N.....	Sam'l Routt & Co.....	Huntsville
Strieff, M.....	M. Strieff	Huntsville
Vaughn, Wm.....	Wm. Vaughn	"
Ward, Harry.....	Harry Ward	Moberly
Williams, J. B.....	L. B. Williams	"

LAFAYETTE COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Missouri River Coal Co.	Mack Warner.	Lexington.
Moore, D. J.	D. J. Moore.	Napoleon.
Morgan, W. P.	W. P. Morgan.	Corder.
Norfleet, T. J.	Daggs & Bush.	Mayview.
Perry, Thos.	Thos. Perry.	Bates City.
Reily & Keist.	Reily & Keist.	Lexington.
Roswell, J., & Bro.	Jas. Roswell & Bro.	"
Salt Fork Coal & Mining Co.	Salt Fork Coal & M. Co.	Corder.
Southwestern Coal Co.	Southwestern Coal Co.	Kansas City.
Spruce, Seth.	Seth Spruce.	Lexington.
Strathman, Henry.	Geo. Urban.	Alma.
Seawell, J. M., & Co.	J. M. Seawell & Co.	Kansas City.
Summers, W. M.	M. W. Summers.	Alma.
Thomas, Frank.	F. Thomas.	Higginsville.
Walnut Grove mine.	J. P. Hendrick.	Lexington.
Walton, Thos.	Thos. Walton.	Concordia.
Waverly Coal & Mining Co.	Waverly Coal & M. Co.	Waverly.
Woskoski, M.	M. Woskoski.	Higginsville.

LINN COUNTY.

Bottomly, J. C.	J. C. Bottomly	Brookfield
Brookfield Coal Co.	Brookfield Coal Co.	"
Fifield, Moses.	M. Fifield.	"
Landrith & Son.	Landrith & Son.	Marceline.
Marceline Coal Co.	Marceline Coal Co.	"
Schaeffer, Bernard.	B. Schaeffer.	Brookfield

LIVINGSTON COUNTY.

Cox, W. A.	W. A. Cox.	Chillicothe.
Moorsville Coal Co.	Hobt. Ford.	Moorsville.

MACON COUNTY.

Baldwin, D. B.	W. H. Phillips.	New Cambria.
Bevier Black Diamond	Bevier Black Diamond.	Bevier.
Freele, Wm.	Wm. Freele.	Macon City.
James & Son.	James & Son.	Bevier.
Kansas & Texas Coal Co.	Kansas & Texas Coal Co.	St. Louis, Mo.
Little Pittsburg Coal Co.	Little Pittsburg Coal Co.	Lingo.
Loomis Coal Co.	R. G. Rombauer, receiver.	Bevier.
Richmond, J. G.	Campbell & Gorman.	College Mound.
Terrill R. S.	R. S. Terrill.	Macon City.
Vese, David.	David Vese.	Laplata.
Watson Coal Co.	W. S. Watson.	Bevier.

MONTGOMERY COUNTY.

Black Diamond.	H. A. Denis.	Wellsville.
Buford & Noel.	Buford & Noel.	"
Vandalia Coal Co.	Vandalia Coal Co.	"

NODAWAY COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Bird, C	C. Bird	Quitman.....
Bridges, Thos.....	Thos. Bridges	"
Carpenter, Roy.....	H. Mason & Son.....	Burlington junction
Ellenworth, Rufus.....	R. Ellenworth	Quitman.....
Martin, H. W.....	William Miller	"
Nichols Bros.....	Nichols Bros	"
Potts, W. W.....	T. H. Howard	Burlington junction
Smith, Jno. W.....	W. E. Seaton	Quitman.....
Viets mine.....	A. Carson	Hughesville

PUTNAM COUNTY.

Audrews, Jefferson.....	Jeff Andrews	Unionville
Adkins, Wm.....	Wm. Adkins	Howiand
Bass, Wm. H.....	Wm. H. Bass	Zola
Blackbird Coal Co.....	Wm. Love	Blackbird
Emporia Coal & Coke Co.....	Emporia C & C. Co	Unionville
Leck, Jno.....	John Leck	Mendota
Lizzie mine.....	W. & J. Rodgers	Pearl City Iowa
McFatridge, J. C.....	J. C. McFatridge	Dean, Iowa
Mendota Coal & M. Co.....	Mendota C. & M. Co	Mendota
North Missouri B. C. Co.....	North Missouri B. C. Co	Pearl City, Iowa
Vandyke, Mrs. Ellen.....	Mrs. Ellen Vandyke	Grayville
Veach, Roy.....	Jas. Cain	Mapleton

RANDOLPH COUNTY.

Bradley, D. T.....	D. F. Bradley	Moberly
Breckinridge, Jno.....	John Breckinridge	Huntsville
Brown & Weisby.....	Brown & Weisby	Renick
Caffery Baker Coal Co.....	Huntsville Coal Co	Huntsville
Davis & Jones.....	Davis & Jones	Moberly
Dean, Harvey.....	H. Dean	Jacksonville
Eagle Coal Co.....	Eagle Coal Co	Moberly
Edwards, E.....	E. Edwards	Huntsville
Elliott mine No. 3.....	Elliott Coal Co	Elliott
Enterprise Coal Co.....	John Cronan & Co	Moberly
Gibbons, Adam.....	W. M. Brenan	"
Headrick, Jas.....	Boone & Graves	Higbee
Higbee Coal & M. Co.....	W. M. Walton Supt	"
Interstate Mining Co.....	Wm. Walton, Supt	"
McCann, Hugh.....	D. W. Skinner	Moberly
Millburn, Joseph.....	Millburn Sons	Thomas Hill
Mitchell & Co., W. E.....	W. E. Mitchell & Co	Huntsville
Morris, Jno. L.....	Jno. L. Morris	Renick
O'Toole, Joseph.....	Jos. O'Toole	Mount Hope
Robinson, Jas. F.....	Jos. F. Robinson	Huntsville
Rutherford, W. T.....	W. H. McKiernan	Moberly
Stewart, J. N.....	Sam'l Routt & Co	Huntsville
Strieff, M.....	M. Strieff	Huntsville
Vaughn, Wm.....	Wm. Vaughn	"
Ward, Harry.....	Harry Ward	Moberly
Williams, J. B.....	L. B. Williams	"

ANNUAL REPORT OF THE

RALLS COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Atkinson, John A.....	Jno. A. Atkinson.....	Perry.....
Ralls County Coal Co.....	Ralls Co. C. Co.....	".....
Standard Coal Co.....	A. L. Stapleton.....	".....

RAY COUNTY.

Bissell Coal Co.....	Good, Mason & Co.....	Orrick.....
Black Diamond mine.....	Douglas & Izett.....	Richmond.....
Bryan & Co.....	Bryan & Co.....	Lakeview.....
Climax m'ne.....	Chas. J. Johnston.....	Georgeville.....
Flag, R. A.....	H. A. Dickason & Son.....	Richmond.....
Hayson & Humble.....	Hayson & Humble.....	".....
Hubbell, Hyatt & Hubbell.....	Hubbell, Hyatt & Hubbell.....	".....
Hubbell & Fisher Coal Co.....	Hubbell & Fisher Coal Co.....	".....
Huston, Joseph.....	F. Huston.....	Lakeview.....
Kansas & Texas Coal Co.....	Kansas & Texas Coal Co.....	Fleming & St. Louis.....
King, R. A.....	J. W. Sterns.....	Hardin.....
Lockwood-Lusk Coal Co.....	Lockwood-Lusk Coal Co.....	Kansas City.....
Loeven, Joseph.....	Joseph Loeven.....	Lakeview.....
Marshalls Mine.....	J. J. McCorkindale.....	".....
Milligan Mine.....	Dickson & Stuart.....	Richmond.....
Mosby Bros., Mine No. 10.....	Mosby Bros.....	Camden.....
Mosby mine.....	John W. McCart.....	Richmond.....
Murray, Jessie.....	J. Murray.....	".....
Pence & Anderson.....	Pence & Anderson.....	".....
Pence & Calmer.....	Pence & Calmer.....	".....
Mine No. 11, Richmond.....	Jos. Pickering Coal Co.....	".....
Rankin, A. F.....	A. F. Rankin.....	".....
Richmond & Camden Coal Co.....	Richmond & Camden C. Co.....	".....
Starr, Alex.....	Wm. Phillips.....	Hardin.....
The Major Grimes Mines.....	James Blair.....	Knoxville.....
Whiteman, Josiah.....	J. Whiteman.....	Richmond.....
Williams Coal Co.....	R. J. Williams.....	Swanwick.....
Wilson Coal Co.....	Wm. Wilson.....	Richmond.....

ST. CLAIR COUNTY.

Allison, R. W.....	R. W. Allison.....	Taberville.....
Barnett, Jas.....	A. J. Davis	Iuka Springs.....
Hoover mine.....	Henry Wilcox.....	Osceola.....
Kniernin, J.....	Wm. Howard.....	Deepwater.....
Short, J. D.....	J. D. Short	Iuka
Thompson mine	Wm. Hines	Eidorado Springs.....
Vista Coal mine	D. L. Douthat	Vista
Watkins, Wm	Wm. Watkins	Osceola

SALINE COUNTY.

Hyem, J.....	John Highlv.....	Sweet Springs.....
Taylor, Henry.....	Henry Taylor	Mt. Leonard

Compliments of

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Geo. E. Quinby,

State Mine Inspector.



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LETTER OF TRANSMITTAL.

JEFFERSON CITY, Mo., Oct. 15, 1896.

HON. LEE MERIWETHER, Labor Commissioner:

SIR—Herewith please find the Tenth Annual Report on all mines other than coal mines of the State, as required by law.

Respectfully,

F. A. LAGRANGE,

State Mine Inspector.



REPORT.

Notwithstanding the depressed condition of the markets of the year in almost every article produced from the earth, it is our pleasure to show in this report an increase of \$258,946 in the amount received for lead and zinc over the preceding year, and this, too, from an actual decrease in tonnage. The lead ore product for 1895 amounted to 61,618 tons, and for this year to 65,504 tons, or an increase in favor of our fiscal year ending June 30, 1896, of 3886 tons. With zinc ore the situation is reversed, for during the year 1895 the zinc ore produced amounted to 101,294 tons, as compared with 92,754 tons, showing a decrease of 8540 tons for the past year.

The average price received for all grades of lead ore in 1895 was \$30.06 per ton, and for this last year \$30.33 per ton, or an increase of but 27 cents per ton. In zinc, however, the difference is more pronounced. Last year the average price of all grades of zinc ore was \$16.86 per ton, and for this past year the price averaged \$19.75 per ton, or an increase in price per ton of \$2.89 in favor of the year just closed.

This showing is so remarkable that for a confirmation of our statement we would refer to table IV of this report, wherein the average price of spelter in New York for each month from the year 1875 down to the 1st day of October, 1896, is given, attention being called to prices obtained in the months of August, September and October, 1895, and February, March and April 4 of this year, and to a comparison with the same months of the previous year.

It is true that our fiscal year embracing the period from July 1 to June 30, secures the best figures in both 1895 and 1896, yet our fiscal year has embraced the same period for a number of years past, and our comparison of one year with another is proper and correct.

The money value of the increase in lead ore for the past year compared with the year previous, amounts to \$134,755. For zinc the gratifying increase of \$124,191 with a product of 8441 tons less is shown.

With this showing for the lead and zinc industry of the State, under the unfavorable conditions existing during the past year in trade, and a stringent money market, what would grand old Missouri do along this line of trade if the business of the country was prosperous and money easy?

BARYTES.

Barytes is found and shipped from several counties in the State. Washington county, however, furnishes the largest amount placed on the market, Long & McGregor of Potosi being the largest shippers in the State.

Washington county ships from 8500 to 11,000 tons annually. During the past year Potosi shipped 3000 tons; Cadet shipped 3000 tons and Mineral Point shipped 2500 tons. The average price received per ton on board the cars at the shipping point was \$4.50 per ton; from which it will be seen that this product produces quite a nice sum each year amounting to \$40,000 to \$50,000 annually.

Barytes is used principally as an adulterant; it is ground into a pure white, tasteless powder, much heavier than lead. Being very cheap, the reason for its being used so extensively in the adulteration of sugar, candies, paints and many other articles is obvious. Packers of meat use it in large quantities, ostensibly, to exclude the air from meats packed in a canvas covering. This canvas is thickly coated with a wash made of barytes after the same has been colored with chrome yellow. The weight of barytes is so great that it is estimated that the simple wash or coating placed on the canvas saves to the packer the entire cost of canvas, wash and the labor employed in placing the canvas upon the meat, when the meat and all are sold by weight at meat prices.

TABLE I—*Lead and Zinc Mines.**Comparative table for the years 1895 and 1896, ending June 30.*

	1895.	1896.	Increase	Decrease.
No. counties producing lead and zinc ores.	9	8		1
No. shafts operated during the year.....	640	455		185
No. tons of lead ore mined during year...	61,618	65,504	3,886	
No. tons of zinc ore mined during year...	101,294	92,754		8,540
Amount received for lead ore product....	\$1,852,400	\$1,987,155	134,755	
Amount received from zinc ore product...	\$1,707,665	\$1,831,856	124,191	
Total amount received for the output of both lead and zinc	\$3,560,066	\$3,819,012	258,946	
Average price per ton received for lead ore	\$30 06	\$30 33	27	
Average price per ton received for zinc ore	\$16 86	\$19 75	2 89	
Total number miners employed	3,713	3,080		633
“ outside men employed.....	1,660	1,118		542
“ prospectors at work	841	708		133
“ all men empl'd and prospec'g.	6,214	4,906		1,308
“ employes fatally injured	23	13		10
“ “ non-fatally injured.	32	19		13
“ wives made widows	14	9		5
“ children made fatherless.....	43	13		30
No. tons of ore mined for each life lost...	7,083	12,173	5,090	

TABLE II—Showing, by Counties, Product, Value of Same, Plant, the year ending

County.	Number of shafts.....	Machinery in use.				Employees, including prospectors.		Lead ore product.			Total tons lead ore,.....
		Bolters	Pumps	Crushers	Steam jigs.....	Miners,.....	Other emp'les	Total.....	High grade ..	Low grade ..	
Jasper.....	256	213	120	88	125	1,796	1,000	2,811	14,399	160	14,559
Jefferson	10	1	.....	.....	.....	60	15	75	251 $\frac{1}{4}$	.....	251 $\frac{1}{4}$
Lawrence	58	30	32	13	30	289	196	485	1,375	.....	1,375
Madison.....	6	3	4	1	12	149	72	221	3,179	.....	3,179
Newton.....	59	36	33	5	17	228	98	326	1,876 $\frac{1}{2}$	.....	1,876 $\frac{1}{2}$
St. Francois ...	9	48	28	19	240	447	369	816	36,900 $\frac{1}{4}$	5,470 $\frac{1}{2}$	42,371 $\frac{1}{4}$
Washington ...	56	2	3	1	.....	110	61	171	1,892 $\frac{1}{4}$	.....	1,892 $\frac{1}{4}$
Wright	1	3	1	1	3	1	.....	1	.....	.....	.....
Totals	455	836	221	128	427	3,080	1,826	4,906	59,874 $\frac{1}{4}$	5,630 $\frac{1}{2}$	65,504 $\frac{1}{4}$

Total tons high grade lead ore, 59,874 $\frac{1}{4}$; average price received, \$30.98 per ton, amounting to \$1,855,315.58.

Total tons low grade lead ore, 5,630 $\frac{1}{2}$; average price received, \$23.42 per ton, amounting to \$131,889.64.

Total for both grades lead ore, \$65,504 $\frac{1}{4}$; average price received, \$30.33 per ton, amounting to \$1,987,155.22.

Total tons high grade zinc ore, 81,824 1-6; average price received, \$20.77 per ton, amounting to \$1,699,738.96.

Total tons low grade zinc ore, 10,930; average price received, \$12.08 per ton, amounting to \$132,117.49.

Total for both grades zinc ore, \$92,754; average price received, \$19.75 per ton; total amount, \$1,831,856.45.

Employes and Machinery of Lead and Zinc Mines of Missouri, for June 30, 1896.

Zinc ore product.			Average price received per ton.		Amount received for output of		Total amount received for output of lead and zinc for the year ending June 30, 1896.
High grade	Low grade	Total tons zinc ore.....	Lead	Zinc	Lead	Zinc	
73,905 ² ₃	187 ¹ ₃	74,094 1-6	\$33 85	\$20 87	\$492,932 90	\$1,546,449 44	\$2,039,882 34
.....	1,102	1,102	32 00	11 00	8,056 00	12,122 00	20,178 00
6,715	4,276	10,991	32 36	16 09	44,500 36	176,924 64	221,425 00
.....	.....	.....	30 00	.....	95,370 00	.....	95,370 00
1,168 ¹ ₂	5,364	6,532 ¹ ₂	33 92	14 65	63,743 55	95,751 37	159,494 92
.....	.....	.....	29 09	.....	1,232,878 11	.....	1,232,878 11
.....	.....	.....	26 25	.....	49,674 30	.....	49,674 30
35	.....	35	.....	17 40	.....	609 00	609 00
81,824 1-6	10,929 ¹ ₂	92,754 ² ₃	30 88	19 75	1,987,155 22	1,831,856 45	3,819,011 67

COMPARED WITH PREVIOUS YEAR:

	1895	1896	Increase.	Decrease.
Lead.				
Average price, high grade.....	\$30 10	\$30 98	.88	.....
Average price, low grade.....	18 52	23 42	4.90	.....
Zinc ore:				
Average price, high grade	18 12	20 77	2.65	.....
Average price, low grade.....	10 05	12 08	2.05	.....

TABLE III—Comparative Table of Lead and Zinc Product of Missouri, 1892 to 1896, Inclusive.

County.	Lead ore.					Zinc ore.				
	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.
Greene.....	406,111	.....	102,34	212,5	.....	886,60	.....	.....	900	1,6
Jasper.....	11,500,96	10,241	14,762	15,456	14,559	106,014,01	82,887,2	63,877	73,704	74,094,1-6
Jefferson.....	412,60	1,023,7	424	455	251 ³	2,076	1,562	921 ⁴	.....	\$2,039,352,34
Lawrence.....	5,720,30	2,194,5	3,567	3,152	1,375	13,861,28	16,178,8	15,855 ⁵	17,738	10,391
Madison.....	4,403,25	4,155,9	3,493	3,546	3,179	.....	.....	.....	.....	20,178,00
Newton.....	1,249,63	1,457,1	1,690 ⁶	1,784	1,576 ¹	8,342,75	8,048	7,590 ²	8,738	6,562 ⁴
St. Francois.....	23,740	20,348,8	26,126 ⁷	34,510	42,371 ⁴	.....	.....	.....	.....	139,494,92
Washington.....	1,793,63	876,6	1,704 ³	2,503	1,802 ⁴	.....	.....	.....	.....	1,232,878,11
Wright.....	.....	.....	.....	.....	.....	.....	.....	.....	97	35
Totals.....	49,626,42	40,297,6	52,003 ⁴	61,618 ⁵	65,204 ³	131,487,64	108,591	89,150 ⁴	101,294	92,754 %
										\$819,011,67

Total receipts
at mines for
output of lead
and zinc, year
ending June 30
1896.....

TABLE VII.

The following table, showing the lead ore production of the Doe Run Lead Co., from the year 1888 to June 30, 1896, has been kindly furnished us for publication by Mr. P. F. Graves, Assistant Superintendent of above named company :

For the year 1888	5,800,000 pounds
" " 1889.....	10,487,000 "
" " 1890.....	11,032,400 "
" " 1891.....	8,437,900 "
" " 1892.....	6,696,200 "
" " 1893.....	7,186,600 "
" " 1894.....	9,018,540 "
" " 1895.....	11,400,000 "
" " 1896.....	20,684,000 "
Total.	90,742,640 = 45,371 tons.

TABLE VIII—Showing the Plant, Employes, Tonnage and Value of Ending

JASPER

Name of mine, company or owner.	Name of lessee or operator.	Shafts oper. Number	Machinery in use.				Employees Total.....
			Boilers	Pumps	Crushers	Steam-jigs	
A. B. P. Mining Co.	Frank L. Yale	1 70					
Allen land							
Beckwith-Hall Mining Co.	Beckwith-Hall Mining Co.	1 160					
Becky Sharp Mining Co.	Becky Sharp Mining Co.	5 130					
Blair Boy	C. W. Reed	2 125	2 2 1	3	15	15	30
Bolen Lead & Zinc Co.	Bolen Lead and Zinc Co.	3 140					
Cave Springs Mining Co.	Cave Springs Mining Co.	2 50	2 2 1	3	16	4	20
Cave Spring Mine	The Irlsing Mining Co.	4 90	2 1	3	2	12	10
Center Creek Mining Co.	Center Creek Mining Co.	30 140	14 11	11	10	200	100
Center Valley Lead and Zinc Co.	Center Valley L. and Z. Co.						300
Chatham Mining Co.	Chatham Mining Co.	10 150	12 2	6	6	75	50
Columbia Mining Co.	Columbia Mining Co.	2 100	3 2 2	2	2	18	4
Daugherty & Davey	Daugherty & Davey	1 150	1		1	1	7
Daugherty, Davey & Daugherty	" Davey & Daugherty	6 130	2 1	1	2	31	2
Davey, Tower & Co.	Davey, Tower & Co.	3 125	4 2	3	3	25	6
Eastern Star Mining Co.							
Edgar, S. C.	S. C. Edgar	5 160	3 2			20	2
Eleventh Hour Mining Co.	J. H. Ayler	14 160	18 5	1	16	150	24
Emma Mining Co.	Edgar Mallett						
Free Coinage Mining Co.	Jerry Clark	2 130	2 2	1	1	15	1
Funk-Bowman & Co.	Funk Bowman & Co.	1 150	1			5	1
Get There Mining Co.	Jas. O'Neill	28 160	7 3	1	2	60	30
Granby Mining & Smelting Co.	Granby M. & S. Co., Joplin	24 87	26 19	8	4	189	50
" "	Oronogo	14 60	1 1	1	1	30	10
Hardin Mining Co.							
Ground & Irwin	Ground & Irwin	5 100	9 5	4	8	60	10
Guinn & O'Keefe	J. H. Claycomb & Co.	3 100	2 3	1	4	14	4
Harrison & James	Harrison & James	6 95	4 3	2	1	50	1
Hatfield & Lawrence	D. H. Hart	1 75	3 3			10	1
Horseshoe Mining Co.	Prairie Belle Mining Co.	1 140	2 1	1	1	14	1
Indiana & Missouri Mining Co.	Blue Goose Mining Co.	5 130	4 2		1	10	4
Joplin Prospecting Co.	Joplin Prospecting Co.	5 150	4 3	2	1	40	5
Lena Mines	G. W. Roe	2 75	1			7	2
Lewis, J. F.	J. F. Lewis	1 165	1		1	20	20
Lichliter & Lear	Lichliter & Lear	1 140	2 1	1	2	5	10
McCorkell-Hill Mining Co.	McCorkell-Hill M. Co.	2 160	2 1	1	1	17	10
McCurdy Mine	Sanborn & Wilson	1 50				7	2
McKinley Mining Co.	Wise, Conner & Wise	3 100	2 1			50	..
Mahaska Mining Co.	Mahaska Mining Co.	6 40				6	2
Minnemac Mining Co.	Minnemac Mining Co.	2 120	2 2	1	1	6	3
Moonshine Mining Co.	Moonshine Mining Co.	1 100				5	2
Niagara Lead and Zinc Co.	Niagara Lead and Z. Co.	4 185	2 2			20	10
Norton Heights Mining Co.	Norton Heights M. Co.	1 150	1			4	2
Perry Mine	E. F. Perry	1 180	5 4	4	8	22	2
Quartette Mining Co.	Quartette Mining Co.	3 145	1	1	3	8	11
Quintuple Mining Co.	Quintuple Mining Co.	5 100	4 1			30	10
Rabbits-foot Mining Co.	G. H. Elmons	1 75	1 1	1	1	7	6
Reed Mining Co.							18
Rex Mining & Smelting Co.	Rex Mining and S. Co.	20 90	6 3	2	2	100	7
Richland Mining Co.	Richland Mining Co.	2 160	2 2			40	2
Roach, Warren & Peterson	Roach, Warren & Peterson	1 45	4 1			4	4
Scotia Mining Co.	H. H. Gregg	3 { 85 } 4	1			30	5
South Joplin Mining Co.	South Joplin Mining Co.	2 130	4 4	1	3	11	12
Standard Zinc Co.	Standard Zinc Co.	2 175	3 3	3	4	6	12
Taylor Land	Mingo Mining Co.	8 125	4 3	2	2	50	2
Taylor Land and Mining Co.	Taylor Land and M. Co.	1 60	1 1			2	1
The Attie R. Mining Co.	Noel & Blair	2 145	1 1	1	2	20	10
The Duenwig Mining Co.	J. A. Hardy	1 140	1 1	1	2	10	13

*the Lead and Zinc Product of the Mines in Missouri for the Year
June 30, 1896.*

COUNTY.

No. of men prospecting	Lead ores—tons.	Zinc ores—tons.	Am't recd. per ton lead ore.	Am't recd. per ton lead ore.	Total amount received for zinc ore.....		Total amount received for both lead and zinc ores.....		
					Total amount received for lead ore.....				
			Low grade.....	High grade.....	Low grade.....	High grade.....			
1	1.75	11.50	\$26 32	\$20 00	\$15 04	.....	\$46 06	\$172 96	\$219 02
	91.10	45.	33 00	15 72	3,004 32	707 40	3,711 72	.....	3,711 72
	3.85	11.75	31 96	21 59	107 22	258 68	360 90	.....	360 90
	21.50	1,124.	32 00	18 00	688 00	20,232 00	20,920 00	.....	20,920 00
	19.75	1,084.	32 02	22 02	635 03	23,577 26	24,512 29	.....	24,512 29
	1.	380.	33 00	22 00	.....	33 00	8,360 00	8,360 00	8,360 00
	12.	9 75	32 00	19 75	314 56	14,536 00	14,550 50	.....	14,550 50
	297.	7,058 35	35 40	20 23	10,457 28	142,783 34	142,783 34	158,330 62	158,330 62
	14.	617.	7,223 50	34 05	20 79	21,012 05	150,224 24	171,236 29	.....
	6	599.	846 75	33 00	19 00	19,768 75	16,058 25	35,857 00	.....
	2	31.20	92 20	82 50	16 80	1,037 11	1,548 96	2,586 07	.....
	4	155.50	419.	32 50	16 80	5,058 75	7,033 20	12,092 05	.....
	79 50	1,124.50	25 50	19 65	2,842 50	22,096 42	24,938 82	.....	24,938 82
	9.	121.	938 50	32 00	20 00	3,872 00	18,770 00	22,642 00	.....
	50	1,688 50	9,210.50	35 74	20 73	60,329 12	190,964 36	251,295 48	.....
	100.	9.25	361.50	28 00	18 00	259 00	6,511 00	6,770 00	.....
	7.50	12.	32 00	16 50	240 00	198 00	438 00	.....	438 00
	10.	1,619 20	1,128.	34 00	18 00	55,052 80	20,304 00	75,356 80	.....
	43	1,646.75	6,150.12	33 52	22 01	55,199 06	135,263 37	190,462 43	.....
	15.	302.73	187.50	28 12	.....	\$13 08	8,512 07	2,452 50	10,964 57
	20.	41.25	3,628	35 00	22 00	1,586 00	74,374 00	75,960 00	.....
	10.75	26.50	38 00	19 65	469 50	588 00	992 50	.....	992 50
	10.	565.	1,458.75	33 95	23 11	19,195 45	28,669 36	47,864 81	.....
	5	84.75.	74.75	36 10	21 61	1,254 47	1,770 14	2,984 61	.....
	14.	2.	524.50	31 00	22 78	62 12	11,334 44	11,394 56	.....
	6	95.75	266.	32 00	20 00	3,064 00	5,320 50	8 340 00	.....
	298.	2,918.50	33 72	20 00	.....	10,098 16	66,482 43	76,581 55	.....
	1	40.	100.	32 00	18 00	1,280 00	1,800 00	3,080 00	.....
	80.	500.	35 00	16 50	2,800 00	8,250 00	11,050 00	.....	11,050 00
	14.	87.50	32 00	18 14	.....	1,587 25	1,387 25	3,972 00	.....
	8	114.75	1,141.	32 00	19 50	3,672 00	22,249 00	25,321 06	.....
	3	50.	175 75	33 60	19 90	130 10	3,497 42	3,627 52	.....
	6.	647.75	21.	32 00	18 00	20,725 60	3,788 00	21,101 60	.....
	6.	117.25	11.20	32 00	15 80	3,752 00	179 94	3,931 94	.....
	5.	200.	.....	21 00	.....	4,200 00	4,200 00	4,200 00	.....
	8.	5 50	50.75	33 00	21 50	181 50	1,090 70	1,272 20	.....
	15.	130.	34 00	22 00	510 00	2,860 00	3,370 00	.....	3,370 00
	14.25	21.	34 00	18 00	492 20	384 43	876 63	.....	876 63
	4	403.25	898 10	32 02	20 03	12,917 78	18,008 67	30,021 45	.....
	125.75	312.50	33 60	18 50	4,225 20	5,771 55	9,996 75	.....	9,996 75
	14.	354.10	.....	21 00	.....	7,439 46	7,439 46	7,439 46	.....
	4	275.	.....	21 07	.....	5,794 25	5,794 25	5,794 25	.....
	40.	1,499.50	3,336.10	35 32	21 50	52,961 34	71,762 95	124,724 29	.....
	671.25	360.	34 00	19 75	19,422 50	7,104 35	26,526 83	.....	26,526 83
	5	50.	211.25	35 00	24 00	192 50	5,096 83	5,278 83	.....
	6	100.	1,150.	36 00	23 50	3,600 00	27,025 00	30,625 00	.....
	7	123.50	1,324.	34 70	22 00	4,384 45	29,128 00	33,533 42	.....
	2	711.	711.	.....	20 00	14,220 00	14,220 00	14,220 00	.....
	25.	318.	3,103.25	35 18	22 43	11,188 29	69,618 55	80,806 84	.....
	5	10.	.....	18 00	.....	150 00	180 00	180 00	.....
	3	94.	1,132.16	34 00	18 15	20,548 82	43,079 00	52,548 82	.....
		1,878.	.....	28 00	.....	3,196 00	46,275 00	46,275 00	.....

ANNUAL REPORT OF THE

EMPLOYES, TONNAGE

JASPER

Name of mine, company or owner.	Name of lessee or operator.	Number.....	Shafts oper.	Machinery in use.	Employees.						
					Steam-jigs...	Boilers...	Pumps...	Crushers...	Miners...	Others.....	Total.....
The Sadtler Lead and Zinc Co.	The Sadtler L. and Z. Co.	1 181	1	1					3	5	8
The Empire Zinc Co.	The Empire Zinc Co.	13 175	8	11	3	6	65	9	74		
Top Run Mine.	Jas. Peel & Others	1 135	1		1	2	6	5	11		
Tower, Davey & Co.	Tower, Davey & Co.	5 120	3	1	2	2	10	8	26		
Troup Mining Co.	Troup Mining Co.	3 200	5	1	3	3	60	4	64		
Verona Mining Co.	Verona Mining Co.	1 30	1	1	1	1	5	6	11		
Victor Mining Co.	Victor Mining Co.	1 195	2	2	4	15	12	27			
Watson & Tranter	E. B. Shunnoay	1 200	3	3	1	2	22	3	25		
White Oak Mining Co.	White Oak Mining Co.	1 58	1		1	1	15		15		
Wright Mining Co.	Yale, O'Brien & Bassett	4 123	4	3	3	3	35	1	36		
Yale & O'Brien	Yale & O'Brien	1 120	1	1			3	1	4		
Zenith Mining Co.	Zenith Mining Co.	1 150	1	1	1	1	3	2	5		
Totals		256	213	120	88	125	1796	495	2291		

JEFFERSON

Valle Mining Co.	Valle Mining Co.	10	100	1	60	10	70
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LAWRENCE

Berry, F.....	B. A. Berry	7 {	35				4	10	5	15
Brinkerhoff Zinc Co.		107		2						
Campbell & Co.	Brinkerhoff Zinc Co.	6 80	4	4	4	3	10	10	10	20
Cleveland & Aurora Min. L. Co.	Paul Schmook.....	2 105	1	1	2	1	30	5	35	
Kentucky Mining Co.	Clevel'd & Aurora M. L. Co	8 60	6	2						
Liles, T. J.	By lessees.....	7 75	4	3			15	22	37	
Minor & Rodgers	T. J. Liles	3 80	3	3	1	10	10	12	22	
Mount Vernon Mining Co.	Scott & Seburn	1								
Pfau, P. M.	Mount Vernon Mining Co	1 180	1	1	1	1	45	5	50	
Rinker, Geo. W.	P. M. Pfau	8 70	1	2	1	1	25	10	35	
Rinker Lead & Zinc Co.	Geo. W. Rinker	1 105					5		5	
St. Louis & Aurora Mining Co.	Rinker Lead & Zinc Co.	1 60	1	10	1		50		50	
Schmook, John.....	St. Louis & Aurora M. Co.	1 75					5	2	7	
Spring River Mining Co.	Paul Schmook.....	6 105	1				24	2	26	
Terre Haute Land & Mining Co.	Spring River Mining Co.	1 160	1	2	2	11	30	6	38	
Blackland, Newman & Falk	Terre Haute Land & M Co	3 110	3	2	1	1	15	4	19	
Totals	Blackland, Newman & Co.	2 65	2	2			15	1	16	
		58	30	32	13	30	289	86	375	

MADISON

Hazard, R.....	R. Hazard	6	100	3	4	1	12	149	47	196
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STATE MINE INSPECTOR.

199

AND VALUE—Continued.

COUNTY.

No. men prospecting.	Lead ores—tons.		Zinc ores—tons.		Am't recd. per ton lead ore.	Am't recd. per ton zinc ore.	Total amount received for lead ore.....		Total amount received for zinc ore.....	Total amount received for both lead and zinc ores.....
	High grade..	Low grade...	High grade...	Low grade...			High grade...	Low grade...		
2	84.75	.....	\$4.50	.....	\$33 00	\$22 00	.....	\$2,836 75	\$1,859 00	\$4,695 75
25	274.25	.....	3,569	.....	31 66	21 53	.....	8,682 75	76,875 60	85,558 35
.....	646.	.....	22 00	.....	.....	.....	.....	14,212 00	14,212 00	14,212 00
.....	103.75	.....	35 55	.....	19 65	.....	3,759 41	10,660 12	14,419 53	14,419 53
.....	223.35	.....	34 28	.....	21 20	.....	7,653 83	30,910 67	38,464 60	38,464 60
.....	1,453.35	.....	20 00	.....	.....	.....	4,865 00	4,865 00	4,865 00	4,865 00
.....	243.	.....	22 08	.....	.....	.....	17,572 00	17,572 00	17,572 00	17,572 00
.....	796.	.....	18,455 00	.....	.....	.....	3,852 00	22,307 00	22,307 00	22,307 00
.....	542.50	.....	250	.....	\$24 00	18 00	.....	3,600 00	4,500 00	8,100 00
2	515.75	150.	34 36	.....	22 54	.....	17,721 17	35,890 61	53,611 78	53,611 78
5	5.75	.....	32 56	.....	21 16	.....	198 21	2,507 46	2,695 67	2,695 67
5	.....	41.	22 17	.....	.....	.....	509 00	509 00	509 00	509 00
520	14,899.	160.	73,905.65	187.50	33 85	20 87	492,932 90	1,546,449 44	2,039,382 34

COUNTY.

5	251.75	1,102.	32 00	11 00	\$8,056 00	\$12,122 00	\$20,178 00
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COUNTY.

7	16.75	59 25	\$30 00	\$10 00	\$502 50	\$592 50	\$1,095 00
6	260	18 77	10 00	20,656 00	19,590 00	3,900 00	3,900 00	40,246 00
9	645.50	867	329.50	32 00	18 00	10 60	3,578 40	26,967 74	30,546 14
.....	106.50	.....	534.50	1,614	33 60	18 00	5,159 50	14,523 00	20,042 50
6	186.25	694	33 20	19 00	10 00	2,091 00	5,168 00	7,257 00	27,975 63
17	61.50	287	34 00	18 00	20 00	9 00	27,975 63	36,600 88	36,600 88
.....	1,172.75	1,172.75	308 75	20 99	20 99	10 45	2,884 23	4,237 89	7,122 12
1	1,748	405 50	37 34	12 35	34 00	12 35	34 00	555 79	555 79
6	77.16	45	32 00	18 00	9 00	1,848 00	10,998 00	12,846 00	12,846 00
10	57.75	311	606	32 00	16 19	2,896 00	3,059 71	5,955 71	5,955 71
8	90.50	189	32 00	14 00	10 80	704 00	6,795 00	7,499 00	7,499 00
10	22	42.50	575	32 00	22 50	3,254 73	10,051 50	13,306 23	13,306 23
.....	101	446.75	32 00	18 00	10 80	132 00	5,103 00	5,255 00	5,255 00
25	4	163.50	200	33 00	18 00	400 00	808 00	1,208 00	1,208 00
5	25.25	4	40	32 00	10 00	.....	.....	.....	.....
110	1,375	6,715	4,276	32 36	16 09	44,500 36	176,924 64	221,425 00	221,425 00

COUNTY.

25	3,179	\$30 00	\$95,370 00	\$95,370 00
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ANNUAL REPORT OF THE

EMPLOYES, TONNAGE

NEWTON

Name of mine, company or owner of mine.	Name of lessee or operator.	Shafts oper. Number	Machinery in use.				Employees.			Total ..
			Depth	Bolters	Pumps	Steam Jigs	Miners	Others		
Gobbler Mine	H. Gross, trustee	1	100	2	2	1	4	12	5	17
Granby Mining & Smelting Co.	Granby Min. & Smelt. Co.	55	90	33	31	3	11	206	81	287
Keystone Lead & Zinc Co.	Keystone Lead & Zinc Co.	1	100	...	...	...	...	6	7	13
Spring City Mining Co.	Spring City Mining Co....	1	110	1	...	1	2	4	5	9
Totals		59	...	36	33	5	17	228	98	326

ST. FRANCOIS

Central Lead Co.	Central Lead Co.	1	370	8	2	2	38	40	50	90
Desloge Consolidated Lead Co.	Desloge Consol. Lead Co.	2	300	7	9	3	45	85	98	183
Doe Run Lead Co.	Doe Run Lead Co.	1	325	11	8	4	37	104	161	265
St. Joseph Lead Co.	St. Joseph Lead Co.	5	440	22	9	10	120	218	48	266
Totals		9	...	48	28	19	240	447	357	804

WASHINGTON

Cyclone Mining Co.	Cyclone Mining Co.	2	50	2	3	1	...	6	4	10
Higginbotham, Z. F.	Higginbotham, Z. F.	20	30	...	...	...	...	20	5	25
Long, James	James Long ....	...	...	...	...	...	...	...	...	...
Long, Wm.	Wm. Long	8	25	...	...	...	...	6	...	6
McArthur, A. P.	McArthur Bros.	10	50	...	...	...	...	8	...	8
Palmer Lead Co.	Palmer Lead Co.	16	150	...	...	...	...	15	5	20
Shibboleth Lead Mining Co.	Shibboleth Lead Min. Co.	6	to 30	...	...	...	...	...	5	5
Union Mining & Smelting Co.	Union Mining & Smelt. Co.	25	...	...	...	...	...	55	6	61
White, Mrs. Lucy	White & Long	6	to 100	...	...	...	...	...	...	...
Totals		56	...	2	3	1	...	110	25	185

WRIGHT

Dodson Lead & Zinc Co.	Dodson Lead & Zinc Co.	1	1	...	1
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ND VALUE—Continued.

COUNTY.

Name prospecting	Lead ores—tons.		Zinc ores—tons.		Am't recd. per ton lead ore.		Am't recd. per ton zinc ore.		Total amount received for lead ore.....		Total amount received for zinc ore.....		Total amount received for both lead and zinc ores.....
	High grade..	Low grade ..	High Grade..	Low grade ..	High Grade..	Low grade ..	High Grade..	Low grade ..	High Grade..	Low grade ..	High Grade..	Low grade ..	High Grade..
	1,646.20		411.50	5,364.50		\$17 17	\$13 75	\$55,970.80	\$5,069.42	73,761.87	129,782.67		\$7,069.42
	55.75		25.65	38.00		21 00		1,839.75	538.91	5,933.00	2,378.66		2,378.66
	174.50		731.25	34.00		19 66				14,381.17		20,314.17	
	1,876.50		1,168.50	5,364.50	38 92	14 65		63,743.55	95,751.37			159,494.92	

COUNTY.

		5,470.50			\$23.40			\$128,059.64			\$128,059.64	
	4,650				\$29 50			137,175.00			137,175.00	
	10,342				29 80			308,191.60			308,191.60	
	12 21,908.75				30 10			659,451.87			659,451.87	
	12 36,900.75	5,470.50			29 09			1,232,878.11			1,232,878.11	

COUNTY.

6	100.				\$30 00			\$3,000.00			\$3,000.00	
	500.				24 00			12,000.00			12,000.00	
	112.60				80 00			8,375.00			8,375.00	
	152.74				30 00			4,582.50			4,582.50	
	458				24 00			11,000.00			11,000.00	
	256				28 00			7,192.80			7,192.80	
	253				28 00			7,084.00			7,084.00	
	60				24 00			1,440.00			1,440.00	
36	1,892.25				26 25			49,674.30			49,674.30	

COUNTY.

		35.			\$17 40				\$609.00		\$609.00	
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ACCIDENTS.

The number of accidents occurring in lead and zinc mines during the year just closed prove to be considerably less than has been experienced for some years. In making a comparison with other periods, based upon the number of tons of ore mined for each life lost, we find no period in the mining history of this State that will compare with this year in the number of tons of ore mined per life lost. If it were possible to refer to accidents as affording any satisfaction, we hope to be excused for indicating the satisfaction afforded us by our record of accidents occurring during the fiscal year just closed; taken in connection with the fact that greater effort has been put forth to secure a complete record of accidents than ever before attempted and yet to find the number of accidents much less than for years previous is very gratifying.

To find accidents becoming less frequent gives promise of the employment of additional safety appliances, the exercise of greater prudence and judgment on the part of both operator and miner.

The total number of accidents occurring during the year ending June 30, 1896, was 32, as against 55 for the preceding period, or a difference of 42 per cent. There were 13 fatal and 19 non-fatal accidents. Compared with the year 1895, the fatalities were 43 per cent less and of non-fatal accidents 34 per cent less.

The average number of tons of ore mined for each life lost was 12,174 tons; for the year previous it was but 7083 tons to each life lost, or 71 per cent in favor of this year.

The tonnage compared with lives lost for the past six years is as follows:

For the year 1891 there were 11,723 tons mined for each life lost.

"	1892	"	10,061	"	"
"	1893	"	8,758	"	"
"	1894	"	8,303	"	"
"	1895	"	7,083	"	"
"	1896	"	12,174	"	"

The following table will show the cause and a percentage of the accidents due to each cause:

Fall of roof.....	25 per cent.
Falling down shaft.....	18 $\frac{1}{2}$ "
Fall of material down shaft.....	18 $\frac{1}{2}$ "
Caught by machinery.....	15 $\frac{1}{2}$ "
Premature explosions.....	12 1-5 "

Fall from scaffold	3 1-5 per ct.
Foul air in mine	3 1-5 "
Cave in	3 1-5 "

From the above table it will be seen that "Falls of Roof" claim the largest number of victims; for 25 % of all the accidents is chargeable to treacherous roof. To prevent accidents of this nature at once presents a problem of great proportions. We have first to consider the immensity of the intervening space between floor and roof; for in many of our mines, this distance often reaches an elevation of 100 feet above the heads of the men at work in the mine. In connection with this feature of the problem, it must not be forgotten that many of our mine operators require the roof of their respective mines to be carefully examined and sounded every day. Yet when we consider that this work is performed in a place completely shut out from the light of day, its great height, and the use of artificial light, it necessarily makes the work of that groping, uncertain kind not always the most satisfactory. It must not be forgotten that there is that insidious work going on in the superincumbent material between roof and floor, out of sight and far from hearing, that no human can fathom or foresee, and that although every part of the roof may be sounded and pronounced safe today, yet the possibilities of a single night under such conditions are such that the following morning may find the roof in a very dangerous condition. Many say these mines should be timbered, but the seriousness of the proposition to say nothing of the practicability of timbering to such an elevation with our operators fighting hard times and a stringent money market, should cause us to hesitate in the demand for such an enormous expenditure of money as this would entail. It is my conviction that any such radical demand at this time would bring about an enforced closing of many of our largest and best mines. It is to be hoped, however, that this frightful enemy and continual menace to life may be lessened if not altogether avoided by some method which can be reasonably applied.

The percentage of accidents due to the falling of material down the shaft is not only large but unnecessary. No shaft opening should be allowed to remain so exposed as to permit material to roll down the shaft without let or hinderance, for such indifference is criminal.

Falling down shaft and premature explosions for the past year appear in most instances to be due primarily to the carelessness of the miners themselves.

Why our miners permit themselves to become so careless in the face of the many appalling accidents due to carelessness in the handling of explosives, it is difficult to understand; especially is this so when it

is remembered that the victims are so many and the miners are so frequently made familiar with the cause and fearful effect of such carelessness.

Mine accidents are somehow peculiarly horrible, and more decidedly so when resulting from explosions. One has only to read the sickening descriptions of some of the accidents occurring last year and referred to in this report to make one avoid even a suspicion of carelessness while handling explosives.

FATAL ACCIDENTS.

James Jones, employed at the Tenderfoot Mine, Jasper county, was instantly killed July 10, 1895, by falling down a shaft.

The deceased, accompanied by a brother miner, were being hoisted out of the mine, when, from some cause yet unknown, Jones fell out of the tub to the bottom of the shaft, a distance of 60 feet. It appears that the hoister was at the time of the accident running the machinery at the usual rate of speed. It is conjectured that deceased allowed his foot to get caught in the lacing of the shaft.

Oscar Christman, one of the owners of the old Christman and Palmer Mines, in Possum Hollow, on the Granby Mining and Smelting Co.'s land, in Jasper county, was killed October 3, 1895, by falling down a shaft. Mr. Christman, at the time of the accident, was on top of a derrick making some repairs. He carelessly took hold of the sling rope, instead of the hoister rope, falling backward and down the shaft, a distance of 113 feet. Late rains had caused the water to rise, and at this time there were 20 feet of water in the shaft. The deceased must have struck an obstruction in his fall, as he uttered no cry nor made the slightest struggle in the water.

Coroner's verdict—accidental.

Sam. Keller, an interested party in operating a mine on the Pinkard lease, Jasper county, was instantly killed November 7, 1895. Mr. Keller had been making some repairs on a pump, and was being hoisted to the surface when a piece of gas-pipe, which had been lying near the shaft opening, commenced to roll and before it could be stopped, fell in the shaft striking the deceased on the head; this caused him to fall out of the tub to the bottom of the shaft.

Coroner's verdict—Accident due to carelessness, but could fix no blame on anyone.

The deceased, it is learned, was a new man ; he heeded not repeated warnings given him by his fellow-workmen to keep off a greater distance than he had been doing, and finally ventured too close, when the rock fell with fatal result.

Coroner's verdict—Met his death by accident.

William Post, a miner, was almost instantly killed in the old Hatten mine in Center creek, Jasper county, February 28, 1896, by fall of a boulder.

About a ton of dirt broke loose from the roof above, bringing with it a large boulder, which struck deceased upon the head.

J. S. Andrews, night watchman, employed by Geo. Evans, an operator on the land of the Elsworth Hoser Mining Co., in Jasper county, lost his life April 6, 1896, by a cave in. The mine in which this accident occurred was thought to be entirely safe, although the excavation in the mine had opened a space of 100 feet between the floor and roof; it was said to be well timbered, and it is thought late heavy rains had undermined the timbers which caused the roof to weaken and cave in. The deceased, with the machinery were both swallowed up by this cave in, carried many feet below and buried from sight.

Geo. M. Koontz, a miner at the Granby mine, at Oronogo, Jasper county, was overcome and died from the effects of foul air, May 2, 1896.

The deceased being the first miner to enter the mine on the morning of the accident was lowered to the shaft bottom, where he became unconscious ; the second man after reaching the bottom of the shaft endeavored to rescue the unconscious man, when he also fell, but managed to call for aid before the third man descended. Several men rushed to the rescue and caused the two men to be hoisted out; both were unconscious when brought to the surface. Mr. Koontz died several hours later. Mr. Printz became rational shortly after and recovered entirely.

Ruben Jones, a miner, employed at the Morning Star mine, on the land of the Chatham Mining Co., in Jasper county, was killed May 9, 1896, by a fall of rock.

Coroner's verdict—Accidental death. No insurance.

Clay S. Gilmore, an employe at the Ohio mine, Joplin Prospecting Co., Jasper county, was instantly killed November 13, 1895, by being thrown down a shaft.

The derick at this mine has a platform on it about five feet above the surface. Miners in ascending rarely if ever went to the platform but as a rule got out of the tub when it reached the surface. On this occasion the horse instead of stopping as usual commenced to trot, and as a result the tub collided with the platform and caused the deceased to be thrown out and down the shaft, a distance of 114 feet, to the bottom.

Jefferson Dameron was fearfully mangled November 21, 1895, by the premature explosion of a blast.

Mr. Dameron was employed by Anderson & Davis, on the Troup land, Jasper county. He was engaged in loading or rather tamping a shot containing five sticks of dynamite; was using an iron tamping bar when the shot fired. His left arm was shot into a mass of jelly, the whole front of his face, including his nose, was shot off; both eyes were blown out and the scalp torn from his head. He lingered awhile when death put an end to his tortures.

Stephen Baker, working in the mine of the Desloge Consolidated Lead Co., in St. Francois county, was instantly killed December 29, 1895, by a fall of rock.

Mr. Baker with others were dumping a car of rock, when a rock from the roof of the mine fell, striking him on the head. The roof had been examined by three men during the night and pronounced safe.

Coroner's verdict—"Unavoidable accident."

John M. Stafford, miner, employed by the West Virginia Mining Co., in Jasper county, was instantly killed January 6, 1896, by an explosion.

The deceased had gone to the drift used only for the storage of powder and caps to prepare a shot, and was there alone when the explosion occurred. It is thought that the deceased in the act of taking a cap from the box, caused a drop of hot oil to fall from the lamp on his head into a cap, and exploding caps and powder.

He was literally torn to pieces; parts of his body were not found until the following day.

Coroner's verdict—By explosion; cause unknown.

William Gibson, employed as a loader at the Doe Run Lead Co., in St. Francois county, was killed February 18, 1896, by a fall of rock.

Loose rock having been discovered in the south end of the mine; the miners were warned of the danger, and the work of blasting down the loose rock was in progress when the accident occurred.

TABLE VII.—Showing Accidents in Lead and Zinc Mines by Counties for the year ending June 30, 1896.

JASPER COUNTY.

Name of employee.	Name of company	Occupation of injured persons.	Insured.		Nature of the accident.	Coroner's verdict.
			No.	Amount.		
Andrews, J. S.	Eleventh Hour Mining Co.	Night watch.	62	1	3	No
Christman, Oscar	Granby Min'g & Smelt'g Co.	Miner.	51	1	2	No
Crossline, Jas.	McCorkle, Hill & Co.	Miner.	51	1	1	No
Dameron, Jefferson	And son & Davis—Troupe L.	Miner.	52	1	1	No
Frey, George	Caylor & Morris—N. Heil's	Miner.	27	1	1	No
Gilmore, Clay S.	Ohio mine—L'Avile Hollow	Miner.	38	1	1	No
Green, Wm.	Stewart mine—Eleventh H.	Miner.	32	1	1	No
Harper, Frank	Holmas lease—Granby land	Miner.	32	1	1	No
Jones, James	Tenderfoot Mining Co.	Miner.	65	1	2	No
Jones, Reuben	Morning Star Mining Co.	Miner.	27	1	1	Yes
Keller, Clem	Pinkard lease	Miner.	25	1	1	No
Koontz, Geo. M.	Granby Min'g & Smelt'g Co.	Miner.	20	1	1	No
McMillan, Chas.	Chatham Mining Co.	Miner.	21	1	1	No
Madden, Claude	Get There Mining Co.	Miner.	10	1	1	No
Manness, Geo.	Chatham Mining Co.	Miner.	36	1	1	No
Morrison, James	Center Creek Mining Co.	Miner.	94	1	1	No
Port, William	Hutton mine—Center Creek	Miner.	30	1	1	No
Reco, George	Bnathan mine—Center Creek	Miner.	40	1	1	No
Renker, John	Duenevrig Mining Co.	Miner.	25	1	1	Yes
Richards, H. J.	Home mine—Eleventh H.	Miner.	52	1	1	No
Rogers, M.	W. Oak mine—Pinkard land	Miner.	62	1	1	No
Siegars, Elsie	Granby land	Miner.	98	1	1	No
Smith, S.	Top Run mine	Miner.	34	1	1	No
Stafford, Jno. M.	West Virginia Mining Co.	Miner.	54	1	1	No
String, Chas.	Reed lands	Miner.	23	1	1	No
Taylor, Gordon	Get There Mining Co.	Miner.	18	1	1	No
Troxell,....	Chatham Mining Co.	Miner.	40	1	1	No
Webb, Noah	Ground & Irwin	Miner.	98	1	1	No
Williams, Thos.	Duenevrig Mining Co.	Miner.	25	1	1	No
			13	18	11	13
			16	2	25	

ANNUAL REPORT OF THE

ACCIDENTS BY COUNTIES—Continued.

LAWRENCE COUNTY.

Name of employee.	Name of company.	Occupation of injured persons.	Insured.		Nature of the accident.	Coroner's verdict.
			No.	Amount.		
Honlous, F. J.	Ozark Range Mining Co.	Shoveller	30 .. 1 .. 1	Yes ..	Dr. bill 1/2 wag	Fall of timber in shaft.....

ST. FRANCOIS COUNTY.

Baker, Stephen.	Deslodge Con. Lead Co.	Labourer	25 .. 1 .. 1	No.	Fall of roof ..	Accidental
Gibson, Wm.	Doe Run Lead Co. ....	.....	23 .. 1 .. -	1 .. 1 .. 2	.....	.....

LIST OF PROPRIETORS AND OPERATORS.

JASPER COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
A. B. P. Mining Co.	Frank L. Yale	Joplin
Becky-Shar Mining Co.	Becky-Shar Mining Co.	"
Beckwith-Hall Mining Co.	Beckwith-Hall Mining Co.	Carthage
Bair Boy Mining Co.	C. W. Reed	Joplin
Blue Goose Mining Co.	Blue Goose Mining Co.	"
Bolen Lead and Zinc Co.	Bolen Lead and Zinc Co.	Kansas City
Cave Springs Mining Co.	Cave Springs Mining Co.	Joplin
Cave Springs Mining Co.	A. O. Ihising	Carthage
Center Creek Mining Co.	Center Creek Mining Co.	Webb City
Center Valley Mining Co.	Center Valley Mining Co.	Carterville
Chatham Mining Co.	Chatham Mining Co.	Webb City
Columbia Mining Co.	Columbia Mining Co.	Carterville
Daugherty & Davey	Daugherty & Davey	"
Daugherty, Davey & Daugherty	Daugherty, Davay & Da'ty	"
Davey, Tower & Co.	Davey, Tower & Co.	"
Edgar, S. C.	S. C. Edgar	"
Eleventh Hour Mining Co.	J. W. Aylor	Webb City
Free Coinage Mining Co.	Jerry Clark	"
Funk, Bowman & Co.	Funk, Bowman & Co.	"
Get There Mining Co.	Jas. O'Neil	Joplin
Granby Mining & Smelting Co.	Granby Mining & S. Co.	"
Ground & Irwin	Ground & Irwin	Duenwig
Guinn & O'Keefe	L. H. Clavcomb	Joplin
Harrison & James	Harrison & James	"
Hatfield & Lawrence	D. H. Hart	Lincoln, Ill.
Horseshoe Mining Co.	Prairie Belle Mining Co.	Webb City
Joplin Prospecting Co.	Joplin Prospecting Co.	Joplin
Lena Mines	G. W. Rowe	"
Lewis, J. F.	J. F. Lewis	Webb City
Litchliter & Lear	Litchliter & Lear	Joplin
McCorkle Hill Mining Co.	McCorkle Hill Mining Co.	Webb City
McKinley Mining Co.	Wise & Connor	Carterville
Mahaska Mining Co.	Mahaska Mining Co.	Blendale
Moonshine Mining Co.	Moonshine Mining Co.	Joplin
Minemac Mining Co.	Minemac Mining Co.	Carterville
Niagara Mining Co.	Niagara Mining Co.	Joplin
Norton Heights Mining Co.	Norton Heights Mining Co.	"
Perry	E. N. Perry	Webb City
Quartette Mining Co.	Quartette Mining Co.	"
Quintuple Mining Co.	Quintuple Mining Co.	Joplin
Rabbits-foot Mining Co.	Rabbits-foot Mining Co.	Joplin
Rex Mining Co.	Rex Mining Co.	Mansfield, Ohio
Richland Mining Co.	Richland Mining Co.	Joplin
Roach, Warren & Peterson	Roach, Warren & Peterson	Covington, Ky.
Roberts Mining Co.	E. B. Shunway	St. Paul, Minn.
Sanborn & Wilson	Sanborn & Wilson	Joplin
Scotia Mining Co.	H. H. Gregg	Kansas City
South Joplin L. & Z. Mining Co.	South Joplin L. & Z. M. Co.	Carthage
Standard Zinc Co.	G. W. Stebbens, Manager.	Joplin
Taylor, John H.	Joplin Prospecting Co.	"
Taylor Land & Mining Co.	Taylor Land & Mining Co.	Webb City
The Attie R. Mining Co.	Noel & Blair	Joplin
The Duenwig Mining Co.	J. A. Hardy	"
The Empire Zinc Co.	The Empire Zinc Co.	Joplin
The Sadtler Lead & Zinc Co.	J. Bachman, Pres't	Bethlehem, Pa.
Top Run Mine	Peel, Malorn, Soort, etc.	Joplin

JASPER COUNTY.

Name of proprietor.	Name of operator.	Postoffice address.
Tower, Davey & Co.....	Tower, Davey & Co.....	Carterville.....
Troup Mining Co.....	Troup Mining Co.....	Webb City.....
Verona Mining Co.....	Verona Mining Co.	Zincite
Victor Mining Co.....	Victor Mining Co.....	webb City
White Oak Mining Co.....	White Oak Mining Co.....	Joplin
Wright Mining Co.....	Yale & O'Brien	"
Yale & O'Brien.....	Yale & O'Brien	"
Zenith Mining Co.....	Zenith Mining Co.....	Kansas City.....

JEFFERSON COUNTY.

Valle Mining Co	Valle Mining Co.....	Valle Mines
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LAWRENCE COUNTY.

Berry, F.....	B. A. Berry.....	Aurora
Brinkerhoff Zinc Co.....	Brinkerhoff Zinc Co.....	"
Campbell & Co.....	Paul Schmook.....	"
Cleveland and Aurora M. L. Co.....	Clev'l'd & Aurora M. L. Co.....	"
Kentucky Mining Co.....	Lots leased to miners.....	"
Liles, T. J.....	Liles, T. J	"
Minor & Rodgers.....	Scott & Seburn	"
Mt. Vernon Mining Co.....	Mt. Vernon Mining Co.....	Mt. Vernon
P. M. Pfau.....	P. M. Pfau.....	Aurora
Geo. W. Rinker.....	Geo. W. Rinker.....	"
Rinker Lead and Zinc Co.....	Rinker Lead and Zinc Co.....	"
St. Louis & Aurora Mining Co.....	St. Louis & Aurora M. Co.....	"
Schmook, John.....	Paul Schmook	"
Spring River Mining Co.....	Spring River Mining Co.....	Pax
Terre Haute Lead and Mining Co.	Paul Schmook	Aurora

MADISON COUNTY.

Hazzard, Rowland.....	Rowland Hazzard	Mine La Motte.....
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NEWTON COUNTY.

Granby Mining and Smelting Co.....	Granby Mining and S. Co.....	Granby
Gobbler mine	H. Gross, trustee.....	Wentworth
Johnson Mining Co.....	Johnson Mining Co.....	Sagman
Keystone Lead and Zinc Co.....	Keystone L. and Z. Co.....	Joplin
Spring City Mining Co.....	C. P. Lewis.....	"





